Stuck in a "death march" project? Author Ed Yourdon dispenses some advice. Managing, page 77

New Web projects put more budget control in hands of businesspeople, not IS. Corporate Strategies, page 71

COMPUTERWORLD

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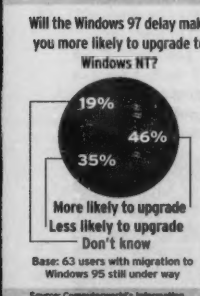
Delays in the next version of Windows will force more users to NT, according to an exclusive *Computerworld* survey.

By April Jacobs



Despite a few days of chaos on Wall Street following confirmation by Redmond, Wash.-based **Microsoft Corp.** that the new version of its popular desktop operating system would be late, most users said they aren't fretting. Corporate

Windows 97, page 127

Software costs trap mainframers

▸ *Shops review licenses amid price concerns*

By Tim Ouellette

MAINFRAMES may cost less, but software doesn't, IS shops are finding.

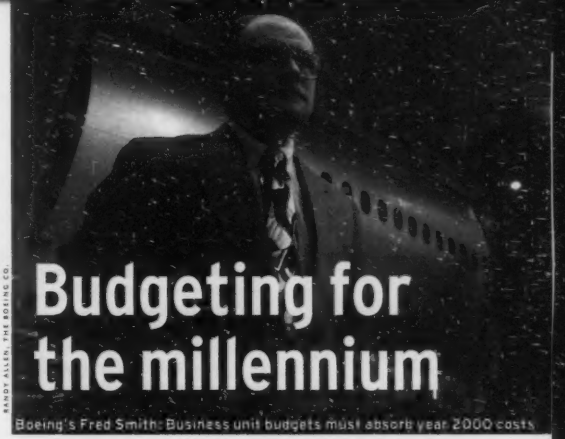
Users said part of the problem is that vendors offer a variety of software licensing options, and the different advantages to each create a complicated patchwork of licenses that inflates management costs.

As a result, users and analysts said, there will be more focus this year on improving the way mainframe software is priced, licensed and maintained. There will be less focus on gains in mainframe hardware.

Probable user strategies include getting rid of older, rigid licensing schemes while avoiding long-term contracts that lock them in to one application.

"We are looking at upgrading our mainframe right now, but software may be the major determining point for us," said Art Louise, assistant vice president at Group Health, Inc. in New York.

Software, page 16



Budgeting for the millennium

Boeing's Fred Smith: Business unit budgets must absorb year 2000 costs

▸ *Year 2000 conversions will trip up other projects and sour end-user support, experts say*

By Thomas Hoffman

COMPANIES TAPPING in to their information systems budgets to pay for year 2000 conversion work face the triple threat of delaying new development projects, undermining end-user support and draining resources from projects meant to boost competitive advantage.

That's the view from the IS trenches at companies such as Boeing, BankBoston and Bell-South, which are grappling with those issues today.

Indeed, more than 75% of 300 Meta Group, Inc. customers polled recently expect the year 2000 issue to delay some of their application projects. "You need to fix these applications to stay in business, but you

Millennium, page 127

Laptop thefts escalate

▸ *Data loss, not cost of hardware, top concern*

By Mindy Blodgett

LA Times' Bart Everett: **"We have to make users aware of the dangers"**

FOR DAN ERWIN, a sign that laptop theft has reached a new and frightening level came when one of his company's notebook computers was stolen on the East Coast at Christmas and recovered just three days later on the West Coast.

"The police recovered these laptops from some criminal ring, and when they booted it up, they saw it was ours," said Erwin, director of information security strategy and planning at The Dow Chemical Co. in Midland, Mich. "It had already been through three hands at that point. We were amazed how far it moved and how quickly."

Laptop, page 14

No tools = no net service levels

By Patrick Dryden

AS DISTRIBUTED information services grow vital to daily business functions, many organizations are seeking the same guarantees on internal data delivery that they expect from outside providers of telephone, power and other essential services.

But information systems managers said they can't define and enforce service-level agreements with users because they lack adequate performance monitoring tools to support this responsibility.

"We're setting [service-level agreements] on paper now to improve our quality, since organizational changes shifted our focus from being technologists to [being] part of the business team," said Alan Robson, director of network systems at direct-mail advertiser Cox Target Media, Inc. in Largo, Fla.

But first, Robson said, he looks forward to emerging tools

Service, page 16

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UP FRONT

Push to the limit

"Push" technology — the new Internet craze that has servers sending data to people who don't ask for it — took a pasting last week.

First, a column in *The New York Times* argued that push is nothing more than a way for publishers to impose their broadcast model on Internet users. Then at PC Forum, a clubby industry conference in Tucson, Ariz., Bloomberg News Service founder Michael Bloomberg ripped push technology as a fad that will disappear when improved bandwidth eliminates the need for it.

With those first stones thrown, it's a good time to ask just where push is going. The answer is that, like most good Internet technologies, it's going into the corporation. But the concept is increasingly unappealing — even distracting — for individual users.

There is a business case for push as a type of extended intranet. Corporate America spends untold billions each year sending paper to remote offices, franchisees and mobile workers. There's a lot to be said for shipping that data off-line and overnight so remote users can call up the latest company information right when they need it.

It's a good time to ask just where push is going.

What doesn't make sense is the notion that users need multiple megabytes per hour of non-work-related data coming across a corporate network. Push seemed like a good idea when PointCast was transmitting a few headlines and stock quotes. But technology developments will soon make it possible for thousands of information providers to push electronic stories and pictures, and only a tiny fraction will ever be read.

Having more information delivered to you doesn't make you better informed. Nor does it do wonders for your corporate network. The technology is cool, but does it make you more productive? That's the question to ask.

Paul Gillin, *Editor*
Internet: *paul_gillin@cw.com*

THE FIFTH WAVE
BY RICH TENNANT

"It's a free starter disk for AOL."

E-mail Rich Tennant at thewave@tiac.net

Users avoid online apps

▸ *Cite fear of fraud, audit trail concerns*

By Lisa Picarille

THE IDEA OF purchasing and getting software delivered electronically may appeal to users, but substantial hurdles need to be cleared before users will fully embrace the concept of electronic software distribution (ESD).

Developers and resellers, who see opportunity and a chance to cut overhead and production costs, are rushing to capitalize on ESD. But users have ticked off a series of concerns including issues related to the actual transaction itself and the delivery of the software or technology.

Topping the list of transaction concerns are fear of fraudulent purchases, credit-card acceptance issues, being able to create and maintain an audit trail and complex sales tax problems.

On the technology side, users said they are leery of maintaining product code and integrity via an electronic download. They want a simple user interface for purchasing the software, an automated launch of products after they are installed, multiplatform support, secure reinstalls in the case of damaged hard drives, automatic builds and rebuilds of software and, most importantly, faster download times.

"This would be a great way to get bug fixes and small updates, but I don't have two days to spend downloading Office," said Raymond Ray, MIS director at Smith Industries, a developer of aerospace components in Malvern, Pa. Ray added that because his company deals with the government, hard copies of purchase orders and documents must be produced, which might prove a hindrance to buying software online.

"Regretfully, everything here has to be stamped and approved by so many people. We need hard copy and signatures, and I'm not sure how that would be handled with ESD," Ray said.

Vendors on all sides are rushing to iron out these issues. Most major software developers said they expect at least 33% of their revenue to come from electronic distribution over the next two to five years, according to a survey of 310 software companies by "Softletter," an industry newsletter in Watertown, Mass.

Microsoft Corp.'s predictions reach even higher. The Redmond, Wash., software giant expects that 40% of its sales will come from ESD by next year.

PRICE DROP

Although delivering applications to users online eliminates costly distribution and shipping charges, users still may not see more than a slight reduction in the actual cost of purchasing the software. This may be partly due to users' continued desire to order hard copy versions of software manuals, which some vendors will charge extra for, according to Jeff Tarter, editor of "Softletter."

Most users agreed that the benefits will eventually outweigh the problems.

Ralph Marshall, manager of technology deployment at the information service department of USAir, Inc. in Winston-Salem, N.C., said although his company isn't purchasing software online, he believes ESD will become an important corporate issue over the next year.

"There is a major potential for distribution savings, because we wouldn't have to deal with expensive shipping charges," Marshall said. □

ONLINE DISTRIBUTION

Companies delivering software online

Clearinghouses	Electronic storefronts
Stream International www.stream.com	@Once www.once.com
CyberSource www.cybersource.com	Software.net www.software.net
Internex www.ican.net	Compuserve.com www.compuserve.com
LitleNet www.litle.net	MSN www.MSN.com

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For these and other related links, point your browser at *www.computerworld.com/links/970331esdlinks.html*

- The impact of electronic software distribution on existing channels: *www.idcresearch.com/HNR/chnnv.htm*
- Electronic Software Distribution: *www.tju.edu/kuctemes1/esdtalk.html*
- Evaluation of products for electronic software distribution: *www.amsinc.com/amscat/abstract.htm@93101*
- The Software Publishers Association (SPA): *w2.spa.org/*
- Softletter: *www.softletter.com/*
- Software acquisition and management: *www.dttus.com/dttus/publishcompexec/3rdqrtr/pageo1.htm*
- About ESD: *www.netsales.net/nsesd.html*

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- **HELL ACCORDING TO YOURDON.** Toiling away at the "project from hell"? Author Ed Yourdon has some advice for you in *Death March*, his new survival guide for *Mission Impossible* projects. Kathleen Melymuka talks with Yourdon in a RealAudio interview. (www.computerworld.com)
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SAP extends R/3 with link to Exchange mail

▶ *Vendor to deliver Exchange Connector this week*

By Randy Weston

SAP AG is tightening the link between its flagship R/3 software system and Microsoft Corp.'s Exchange messaging system to give users a simpler way to distribute R/3 to end users.

The deal also would allow users to streamline business processes by adding electronic messaging functionality to the R/3 client/server-based enterprise management system.

NO SNEAKING IN

But don't think the new links will allow you to skirt per-seat licensing by giving end users backdoor access to R/3 through a messaging system. Analyst Adam Thier at Meta Group, Inc. in Stamford, Conn., warned that SAP plans to charge for use of its product even if a casual end user enters it through a back door.

> "Anything that can increase our efficiency, further increase customer service and reduce our overall workload is something we will take a serious look at."
> – Kent Ford, Monier, Inc.

"SAP has said, 'If you are coming through SAP, whether through our [graphical user interface] or a [business application programming interface], we are going to charge you for that user,'" Thier said.

Thier said the new link does mean that, "If you are an Exchange shop, you will be able to deploy SAP more easily with less support issues to more users than if you were to deploy R/3 alone."

And Thier said German software giant SAP has a history of cutting pricing deals in which users negotiate for lower licensing fees for casual users.

Roofing-tile maker Monier, Inc. in Irving, Calif., is using R/3 and Exchange in its 800-employee business and is looking to link the two systems with the new connector. Although the pricing is a concern, Kent Ford, supervisor of network services, said the benefits of messaging forms directly from R/3 are likely to outweigh any additional costs.

"Anything that can increase our efficiency, further increase customer service and reduce our overall workload is something we will take a serious look at," Ford said.

The link between R/3 and Exchange is SAP's Exchange Connector, being delivered with R/3 3.1 this week. With it, R/3 users can use Exchange to send faxes, Internet mail and other types of electronic mail from R/3. Users can then send to a customer or a supervisor forms such as purchase orders generated in R/3 without physically printing and faxing them or moving the files to the messaging system.

FRONT END

SAP's new messaging application programming interfaces for R/3 also will let users make Exchange the front end for R/3.

SAP has a similar deal with Lotus Development Corp. that integrates the Notes messaging system with R/3. Such deals edge SAP closer to providing an integrated software environment that blends productivity applications such as E-mail or word processing and spreadsheets with R/3's business process applications. □

Tops at training

A look at the 25 best employers for IS training

Computerworld's first information systems training survey finds that great training goes beyond supporting corporate goals. It also provides the programs employees need for career development. Training that serves the company and employee is a matter of scents and sensibility at Avon Products, Inc., according to executives Adrian Dessi, Ronald Mastrogiovanni and Barry Herstein (from left to right).

Careers, page 100

RAFAEL FUCHS

DATA WAREHOUSING

Tools help users delve into metadata

By Craig Stedman

DATA WAREHOUSE managers looking for tools that help end users search for information are finally getting some choices.

Logic Works, Inc. in Princeton, N.J., last week introduced software to inventory and search metadata, the explanatory information that acts as a table of contents for a data warehouse. Users who run analytical queries can turn to the metadata for help in navigating through warehouse data.

The huge volumes of data make metadata search tools mandatory, said Ronald Harris, manager of systems architecture and information engineering at Bell Atlantic Corp. in Philadelphia. "If users had to traverse the entire depth of the data, they'd never get their jobs done."

But user-friendly metadata search tools have been sorely lacking. Existing products "require a certain level of technical upbringing" to use, which makes it hard to spread them beyond information systems workers, Harris said.

Vendors are taking note. Intellidex Systems LLC, a start-up in Winthrop, Mass., released a combination metadata manager/navigator in January. In February, Informatica Corp. in Menlo Park, Calif., announced plans to open the metadata repository in its PowerMart data mart software to direct end-user access.

Logic Works' Universal Directory is the latest shoe to drop.

BUSINESS VIEW

Bell Atlantic is beta-testing Universal Directory for use with a 400G-byte warehouse of marketing data due to go live in July. The Logic Works tool should let the Baby Bell company provide its users with metadata descriptions based on "a business point of view rather than the cryptic names usually associated with database tables," Harris said.

Universal Directory prices start at $30,000. It runs on Windows NT servers and PCs with either NT or Windows 95.

Support for World Wide Web servers and browsers will be added in a second release due out in July or August. □

Apple eyes high end in licensee fee system

By Lisa Picarille

APPLE COMPUTER, INC. is trying to replace its flat-fee licensing deal with clone makers with one based on a percentage of a system's price.

The move was designed to help the company derive more licensing income and grow the overall Macintosh market without fear of increased cannibalization.

The percentage system means Apple could make money through the rise in licensees at the low end while retaining its bread-and-butter users at the high end, where higher licensing fees would help Apple's own products compete on cost.

Specifics of the licensing scheme aren't final, said Guerrino DeLuca, Apple's executive vice president of worldwide marketing.

AFFECTS MAC OS 8

The new licensing structure wouldn't affect current products but would kick in when vendors look to license Apple's Mac OS 8 for the Common Hardware Reference Platform, which is due out this summer.

It would also apply to those who seek licenses for Apple's forthcoming Rhapsody operating system, which is slated to ship in the middle of next year.

Clone makers now pay approximately $50 for the Mac OS license, and they pay a fee for the motherboard as well because parts of the Macintosh operating system are still tied to the hardware.

For users, the new licensing model may increase the number of vendor choices when buying a Macintosh compatible system. Increased competition could also result in lower prices for users, observers said. □

On your mark: Year 2000 progress survey shows widespread use of home-grown tools. Buyer's Guide, page 85

SOUND OFF!

Will the real Universal Server please stand up? Oracle's Jerry Held (left) and Informix's Michael Stonebraker go toe-to-toe. In Depth, page 96

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Chevron pumps Explorer, dumps Navigator on PCs

▸ *Company standardizes on Microsoft*

By Justin Hibbard

CHEVRON CORP., a high-profile endorser of Netscape Communications Corp.'s Navigator, last week said it will switch to Microsoft Corp.'s Internet Explorer as the standard browser on its 27,500 PCs.

The company said it will continue to use Navigator on 2,500 Unix and Macintosh machines.

Chevron technical analysts said the decision wasn't based on dissatisfaction with Navigator, but was part of a larger strategy to standardize the company's desktops on Microsoft software.

A survey of corporate buyers conducted by Computerworld's Information Management Group showed that 10% of Navigator customers plan to switch to Explorer in the next 12 months. Only 2.5% of Microsoft customers said they plan to switch to Netscape.

Mountain View, Calif.-based Netscape is the browser vendor of choice for 69% of those surveyed, but that is down from 76.5% during the second quarter of last year. During the same period, Microsoft's numbers rose from 8.5% to 23.5%.

Similarly, a recent survey by Zona Research, Inc. in Redwood City, Calif., shows Netscape's browser share dropping from 80% to 70% and Microsoft's increasing from 10% to 28%.

Members of the Chevron committee that made the decision to switch confirmed that the company's investment in other Microsoft products and technologies influenced the decision.

The company is standardized on Windows 95, Office 95 and Microsoft's Distributed Component Object Model.

GOING WITH THE FLOW

"We reconfirmed the commitment to Office recently, and you can see the synergy you could get" with other Microsoft products, said Jim Moen, a technical analyst at Chevron Information Technology Co. in San Ramon, Calif.

"We haven't made an architectural decision on ActiveX, but we've been leaning in that direction," he said.

Another deciding factor was the simplification of licensing and support contracts, said Jim Nathlich, a technical analyst at Chevron Information Technology.

The licensing agreement for Internet Explorer is bundled with the licensing agreement for Windows 95, he said.

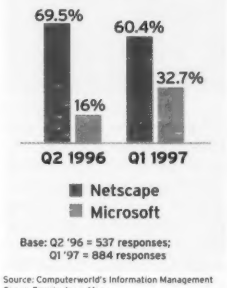
MIXING IT UP

US West Communications, Inc. in Boulder, Colo., which also has a large installation of Navigator browsers and Windows 95 operating systems, said it doesn't intend to switch to Internet Explorer.

Unlike Chevron, which is standardizing every desktop on Windows 95, US West maintains a diverse mix of operating systems on its workstations. Navigator 3.0 is available on 16 platforms, but production versions of Internet Explorer 3.0 are available only for Macintosh and Windows, not Unix.

BROWSER BATTLE

Who will be your primary browser vendor?



Base: Q2 '96 = 537 responses; Q1 '97 = 884 responses

Source: Computerworld's Information Management Group, Framingham, Mass.

"If you don't have platform issues, [Chevron's approach] might be an appealing strategy," said Barbara Bauer, senior director of corporate systems at US West. "For us, cross-platform is critical."

Netscape officials said the company expected to lose browser share starting in the fourth quarter of last year as Microsoft gained momentum with Internet Explorer.

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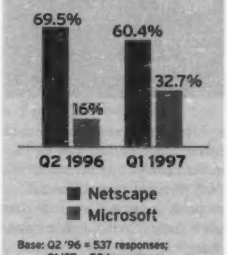

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Novell users crack a smile

▸ *Products, new CEO boost Brainshare outlook*

By Laura DiDio
SALT LAKE CITY

AFTER SUFFERING through three years of technical and marketing missteps, users were decidedly more upbeat at Novell, Inc.'s Brainshare '97 developers conference here last week, thanks to a series of moves designed to get the company back on track.

Novell served up a smorgasbord of new technologies, a new corporate vision and a new CEO to 5,000 conference attendees.

As expected, Novell released its Border Services Internet and intranet blueprint.

The company also released a series of tactical products, including Windows NT integration software packages. And Novell demonstrated its forthcoming, high-end Wolf Mountain clustering technology [CW, March 10].

Those initiatives were designed to help Novell leapfrog past the functionality offered in rival Microsoft Corp.'s Windows NT Server. Novell also is out to shed its image as a legacy file-and-print operating system vendor and transform itself into a networking services company that uses the Internet and Java as its springboard to platform independence.

The initial reactions from two dozen users to Novell's latest efforts to get back on track were overwhelmingly positive.

USTrust's Matt Rice: **"I haven't felt this good" about Novell in four years**

Brainshare attendees were particularly enthused about the hiring of Eric Schmidt, chief technology officer at Sun Microsystems, Inc., to take over as Novell's CEO on April 7.

And users reacted positively to Novell's joint deal with Netscape Communications Corp. to form a new firm, Novonyx, to spur Internet efforts.

BAD BUYING BINGE

"I'm very excited and encouraged by Novell's recent initiatives. I haven't felt this good about them since just before they started their ill-fated buying binge four years ago," said Matt Rice, vice president and senior network manager at US-Trust Bank in Cambridge, Mass.

Rice conceded that Novell has a "lot of lost mind share" to make up. But he said the new Internet initiatives, Schmidt's Internet/Java vision and Novell President Joe Marengi's tactical experience are all positive.

BACK IN FOCUS

David E. Smith, a network manager at C&S Wholesale Groceries Corp. in Brattleboro, Vt., agreed. "I feel Novell is refocused on what they do best, and that they're moving ahead in the areas that count. There's excitement and energy here this year," Smith said.

Some users, such as George Hoffman, technology services manager at Penobscot Bay Medical Center in Rockland, Maine, said Novell's initiatives may be too late. Despite the hospital's satisfaction with the NetWare operating system from a technological standpoint, it will probably convert to Windows NT Server. "There's a feeling of inevitability that we'll go to Windows NT, because our third-party application vendors are telling us that future versions of their products will only support NT," he said. □

TIER IT UP

Web transaction servers enable three-tier processing on the Internet

Tier	Features
Thin clients with Web browsers	• Data presentation interface • Communication and data-access applets
Transaction server linked to Web server	• Business logic • Messaging and security • Transaction management • Session management
Corporate databases	• Data storage • Processing of data requests

Sybase servers on way to run Web transactions

By Craig Stedman

DATABASE VENDORS are racing to field applications servers that let users run three-tier transaction processing applications on the World Wide Web.

Sybase, Inc. in Emeryville, Calif., will join the crush this week with a beta-test release of its Jaguar transaction server for the Web. Oracle Corp. in Redwood Shores, Calif., is testing a transaction-enabled version of its Web Application Server for shipment next month, and Microsoft Corp. released Windows NT-based transaction software in January.

TRANSACTION MANAGEMENT

EASIER DEVELOPMENT

Information systems managers who are working with the transaction servers said the servers are being counted on to provide the reliability and throughput needed to run real business applications on the Web. The emerging software also should reduce development complexity by providing interfaces at a higher level than programmers get when writing directly against a database, they added.

Transaction management "is key on Web sites that sell merchandise," said Sam Gerace, president of Be Free, Inc. in Pittsburgh. Be Free, which operates several sports and entertainment Web sites, plans to use Oracle's transaction server to let users buy products from advertisers without having to go to the sellers' home pages.

The transactions would be processed behind the scenes by links between servers at Be Free and the advertisers. Be Free also will use the Oracle software to process competing answers on a computer-based television game show that is scheduled to debut in September, Gerace added.

Sybase's product, formally called the Powersoft Jaguar CTS (Component Transaction Server), is due to ship in the third quarter on Unix and Windows NT. The beta-test developer's kit will be available Wednesday for free downloads from the company's Web site (www.sybase.com). Pricing for the full version wasn't disclosed.

Jaguar will support Java, ActiveX and C++ for application development and connect to Sybase's own databases and products from Oracle, Microsoft and Informix Software, Inc. Oracle's Web Application Server 3.0 supports Java and the Oracle7 database. Redmond, Wash.-based Microsoft's ActiveX-oriented Transaction Server works with its SQL Server database and is being embraced by Sybase, Informix and IBM.

CROSS-PLATFORM

Sybase's cross-platform support at both the client and database levels was one factor that steered software vendor NetInfo, Inc. in Torrance, Calif., to Jaguar. NetInfo is developing Jaguar-based distributed software for use in collaborative creation of Web content.

Dhruba Kalita, chief technology officer at NetInfo, said the firm needs transaction management to ensure the content gets meshed properly and to provide data recovery capabilities. Software such as Jaguar also shields developers from low-level database interfaces, which makes it easier to write and modify applications, he said. □

Can you spare four seconds?

▸ *Desktop systems to scan network at boot-up*

By Patrick Dryden

IF YOU THINK starting up a PC takes long now, just wait.

It will take an additional four seconds, or maybe much longer, when better-managed desktop and NetPC systems pause first to scan the network before trying to load software locally.

Within the next few months, vendors will broadly implement a "boot intervention" standard in NetPCs and some standard desktop systems, according to Intel Corp. officials.

The NetPC guidelines define a new step in the familiar boot-up sequence so that network-dependent systems can search a LAN first for an operating system.

Other systems that also will take this step include new desktop PCs with a motherboard network interface and legacy PCs fitted with boot ROMs on their network adapters.

When turned on, these systems will take four seconds to seek commands from servers before recognizing any available disk drive. Users will wait longer if the system is scanned for viruses, for example, by a management system on the network.

Intel will be the first to apply this step in an attempt to simplify the arduous migration to Windows 95 or Windows NT.

LANDesk Configuration Manager, which debuts this week, downloads the operating system and automates its installation. For PCs not yet equipped with the preboot agent, a technician inserts a diskette to point the PC to a special server. It costs $10,000. □

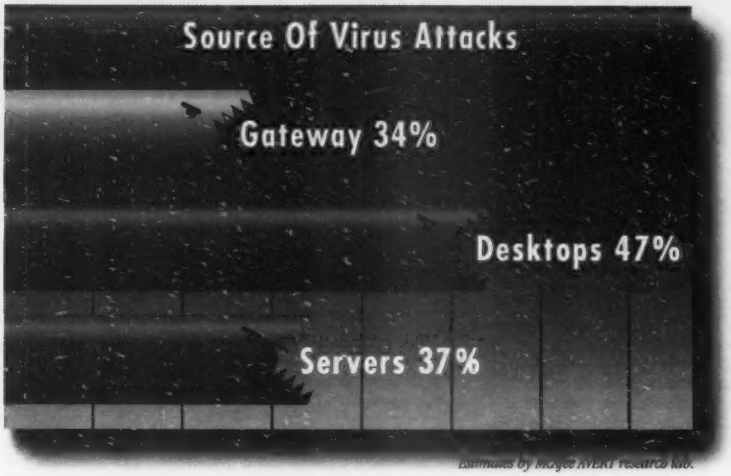
Corrections

The story "Outlook wasn't brilliant, Microsoft warns" [CW, Feb. 10] incorrectly stated that users wouldn't face a desktop upgrade when installing the version of Outlook that will ship with Exchange 5.0. The Microsoft official quoted in the story incorrectly stated that to be true. Microsoft now confirms that a desktop installation will be required.

In the Buyer's Guide on ergonomic keyboards [CW, March 3], a Kinesis official gave the wrong prices. The Kinesis Keyboard costs $225 to $395.

A Marketplace story [CW, March 3] mistakenly said the Toshiba Portege 660 CDT doesn't include a CD-ROM drive or a floppy disk drive. This Toshiba ultralight notebook includes both.

WHY VIRUSSCAN ISN'T GOOD ENOUGH TO PROTECT YOUR NETWORK.



Estimates by McAfee AVERT Research Lab.

INTRODUCING MCAFEE TOTAL VIRUS DEFENSE.™

VirusScan detects 100% of the viruses on the desktop. But that's not the only place viruses attack.

Networks make business more productive. Unfortunately, they're also vulnerable to viruses at literally hundreds of points.

But there is a solution: McAfee Total Virus Defense. The only complete set of solutions that protects all the vulnerable points on your network. From desktops and groupware connections to servers and gateways.

If you're not completely protected, you're completely exposed.

McAfee Total Virus Defense uses the industry's top-rated anti-virus technology to provide unparalleled protection throughout your entire enterprise.

VirusScan is the industry's most effective, and most popular, anti-virus solution. With the new Hunter™ engine VirusScan 3.0 detects 100%* of macro viruses, boot viruses, and other types that attack the desktop.

McAfee Enterprise – Mo'	
Network Security	Network Management
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McAfee anti-virus products are components of a fully integrated NT-centric systems management solution.

NetShield, the industry's leading server protection, guards your network by stopping viruses at the server level. *GroupShield* protects groupware users whose dynamic messaging environments are great for transporting data – and transmitting viruses.

And *WebShield* protects you against viruses from the Internet, the latest and most efficient way to spread viruses.

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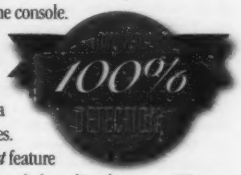
Of course all McAfee virus products include support from AVERT, our Anti-Virus Emergency Response Team. With research centers worldwide, you get 24 hours a day, 7 days a week online support – plus daily virus file updates.



And, for Internet users, our unique *SecureCast* feature automatically sends updated virus detection files and alerts directly to your PC to protect you from the latest virus attacks – like the new Office97 macro viruses.

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*Detection rate based on results from independent industry research using Alwil technology and McAfee-Hunter engine.

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Pumped-up dial-up

▸ *'net providers target needs of business users*

By Mitch Wagner

AN INCREASING number of Internet service providers are rolling out offerings designed to toughen up dial-up Internet services for corporate users.

In the latest developments, MCI Communications Corp. and CompuServe Corp. plan business-class Internet service with beefed-up security and reliability.

Information systems managers said they are becoming aware that business has special needs for dial-up Internet access. They are looking to replace expensive modem banks now used for remote access by road warriors and telecommuters with services from online providers.

"We've had to become a miniature Internet service provider to serve the needs of our users," said Daniel Gasparro, chief technologist at Booz Allen & Hamilton, Inc. in McLean, Va. "We're looking at getting out of that business."

Companies such as UUnet Technologies, Inc. in Fairfax, Va., and BBN Planet in Cambridge, Mass., have offered business-class dial-up services for nearly a year. Compared with consumer services, those offerings have added security features and facilities for managing thousands of users.

Those companies have seen demand grow this year — sparked, at least in part, by the access woes that befell America Online users after the service switched to a $19.95 per-month, flat-rate dial-up account in December.

"We'll pay extra if we can get service when we need it and not have to try back again in a half-hour or an hour," said AT&T Corp. dial-up Internet user Bill Olzak, an MIS manager at Advanced Accessory Systems LLC in Sterling Heights, Mich.

Olzak added, "We're used to getting service on demand. You go to McDonald's and get a burger, or go to an ATM machine and get cash. When we want something, as a public, we're not used to waiting for it."

MCI plans on April 7 to roll out a "tunneling" service as part of its Managed Firewall service. Designed for companies that support road warriors and telecommuters, the service will let users dial up with client software supplied by MCI that encrypts information. The information is uploaded to MCI's global Internet network and travels over a leased line to a firewall located on the customer premises. There the information is decrypted, which allows the dial-up user to communicate over the corporate intranet.

MCI also plans later this year to install equipment on its network to create a high-priority Internet traffic service for which MCI will charge a higher price than its standard service (see story below).

CompuServe, meanwhile, is testing a similar service that runs over its private network and uses Internet technology. Also, CompuServe and Cisco Systems, Inc. are working to support a competing tunneling standard from Microsoft Corp. CompuServe's service will go into wide testing with customers by summer. It will be generally available by year's end. □

More new ways to get on 'net

- **Netcom On-Line Communication Services, Inc., San Jose, Calif.** Flat-rate account announced last week starts at $24.95 per month for a single user and $70 per month for up to 10 users, with E-mail address and Web site. Replaces $19.95 flat-rate plan.
- **AimQuest Corp., Milpitas, Calif.** Consortium of 60 worldwide Internet service providers plans today to announce a dial-up tunneling service. It is expected to be released in mid-April. It is part of AimQuest's "global roaming" offering that allows users traveling in North America, Europe and Asia to log in to their home Internet service provider or corporate intranet with a local call to an Internet service provider.
- **Concentric Network Corp., San Jose, Calif.** Launched a $39.95 dial-up service earlier this month that was designed to offer increased reliability [CW, March 24].

MCI plans priority Internet service

By Bob Wallace

MCI Communications Corp. said last week it plans to offer a premium Internet service for business users later this year.

MCI is installing Cisco Systems, Inc. router upgrades that will let the company prioritize user traffic for an additional charge.

"We're starting to see a fundamental change in the way [Internet service providers] market Internet access, which is good for the health of the Internet," said Tom Nolle, president of CIMI Corp., a consultancy in Voorhees, N.J. "[Internet providers] can provide differentiated levels of service and broaden their revenue streams."

But one user said she wasn't happy about the trend toward providers distinguishing between standard and premium Internet service.

"I don't like the concept at all and don't know that I could recommend to senior management paying extra for a so-called premium service," said Sheryl Olguin, a project leader at Harris Corp. in Melbourne, Fla.

The defense contractor is switching from BBN Planet in Cambridge, Mass., to MCI, based in Washington, for its Internet needs.

"Rather than pursue this new marketing strategy, I'd like to see [MCI] look at implementing a backbone that can serve every user equally well," Olguin said. □

SHORTS

40 nations in IT trade pact

Forty nations, which constitute 92.5% of global trade in information technology products, last week signed a World Trade Organization (WTO) agreement to end export duties on all IT products by Jan. 1, 2000. The Information Technology Agreement is supposed to cut costs for IT vendors and boost world trade. IT products represent 10% of all goods traded. The WTO will specify which products come under the agreement later this year. Tariffs will start to be phased out in most countries July 1, with more cuts due next year and in 1999.

Countries back privacy rights

The 29-nation Organization for Economic Cooperation and Development last week adopted guidelines for cryptography that endorse "fundamental rights of individuals to privacy" and the "right to choose any cryptographic method, subject to applicable law." The statement doesn't explicitly back the Clinton administration's call for an international key-escrow system, which would let law enforcement agents decipher coded material.

Gateway bids for Amiga

Gateway 2000, Inc. in North Sioux City, S.D., last week said it offered to buy the assets of Amiga Technologies, a German computer company that went bankrupt in July of last year. Gateway didn't provide financial details. A court-appointed bankruptcy administrator in Germany, acting on behalf of Amiga, has accepted the offer, but the agreement requires regulatory approval. If the offer receives approval, Amiga Technologies will be renamed Amiga International and operate separately.

Oracle data marts debut

Oracle Corp. this week will introduce long-promised data mart packages that combine its Oracle7 enterprise database with design, data extraction and query tools and its World Wide Web server software. The Oracle Data Mart Suite will run on Windows NT when it ships in May. Unix support is due by year's end. Pricing for the basic suite starts at $39,500 with a 16-user database license. Oracle is licensing the extraction tools from Sagent Technology, Inc. in Menlo Park, Calif.

CIO quits at NCR

After just six months in her dual role as chief information officer and head of NCR Corp.'s professional services division, Alice H. Lusk has left the company to pursue other interests. Sources said Lusk, 49, quickly found the challenge of running both an information systems organization and a commercial services unit too daunting. A spokesman for the Dayton, Ohio-based computer maker said Lusk will be replaced on an interim basis by Charles Picasso, vice president of NCR's worldwide professional services, and Michael Ruffolo, NCR's vice president of IS.

FCC weighs in on 'net charges

The Federal Communications Commission last week issued a paper that raises more questions than it answers on the issue of whether Internet service providers should pay more to use local telephone networks. The FCC paper rejects the Baby Bells' demand that per-minute usage charges be slapped on Internet providers. But the document does say that some type of usage charge may be possible and suggests ways for telephone companies to deal with the controversy, including altering state tariffs, contracting services to service providers or charging their heavy users more.

SHORT TAKES Computer Associates International, Inc. said it will bundle automatic date-correction software developed by Fairfax, Va.-based Information Analysis, Inc. with several of its products for use in year 2000 projects. ... Digital Equipment Corp. and Oracle Corp. subsidiary Network Computer, Inc. (NCI) last week announced a blueprint to build low-cost network computers based on Digital's StrongARM RISC microprocessor and NCI's network computing software. ... This week, Frontier Software Development, Inc. in Chelmsford, Mass., will change its name to NetScout Systems, Inc. ... Microsoft Corp. last week released Internet Explorer 3.02 for Windows 95 and Windows NT.

"They are treating us like runaway slaves."

—Former Informix Programmer

EVENTS

January 22: Eleven programmers quit their jobs at Informix and join Oracle Corporation.

January 22: Phil White, CEO of Informix, drives to the home of Larry Ellison, CEO of Oracle, to ask him to return the eleven "runaway" employees.

"I cannot return your employees," responds Larry Ellison. "They have their own free will. They are different from dishes that you buy at Macy's."

January 23: Informix sues each and every one of the "runaway" employees individually.

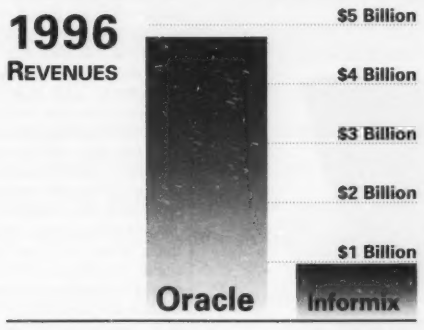
ADVICE

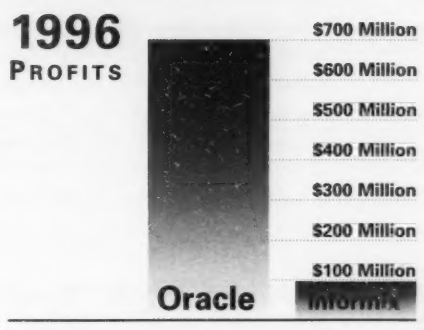
Advice to Informix: Hire programmers not lawyers. If you do, you'll be able to write a universal database like Oracle did, rather than writing a check to buy one from Illustra.

Advice to Informix programmers: Negotiate your legal fees up front.

Advice to Informix customers: Call Oracle.

WHO ARE WE TO GIVE ADVICE? (SEE BELOW)





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Digital to post another slow quarter

▸ *Sluggish sales of high-end Alpha servers delay turnaround*

By Jaikumar Vijayan

THERE IS GOING to be no miracle in Maynard — at least not just yet.

Digital Equipment Corp. on April 17 is expected to announce the results of yet another lackluster quarter amid slowing revenue from its high-end Alpha servers. Analysts said Digital might eke out a profit in the third quarter, but overall revenue is expected to be lower than it was in the same quarter a year ago.

The news will likely be another setback for Digital users, who have watched the Maynard, Mass., company struggle with an on-again, off-again comeback effort that has spanned more than two years.

"I frankly am a bit befuddled by what's going on," said Joseph Pollizzi, president of the Digital Equipment Computer User Society (DECUS) in Baltimore. "They have a great story in terms of products and offerings. But somehow that message is not coming out as strongly as it should."

"They really need to expand beyond their customer base and let others know what they have out there," said Michael Felerski, town systems network manager in Butler County, Ohio. "The problem is when people think of [Digital], they still think VMS and VAX."

Digital has "a great story in terms of products and offerings. But somehow that message is not coming out as strongly as it should."
– Joseph Pollizzi, DECUS

The impending financial news revived analysts' speculation that CEO Robert Palmer's days are numbered at Digital.

"Palmer is on probation. He has to show that he can do something real fast, or he is gone," said James Garden, an analyst at Technology Business Research, Inc. in Hampton, N.H.

NO QUICK FIX

But analysts said a quick recovery is unlikely. "This is not going to be the turnaround quarter" for Digital, said Gary Helmig, a financial analyst at Soundview Financial Group in Stamford, Conn. Helmig said Digital's product revenue for the quarter ended March 31 is likely to be about 10% lower than it was in the same period a year ago, while overall revenue is pegged at 8% lower than it was in the same period the previous year.

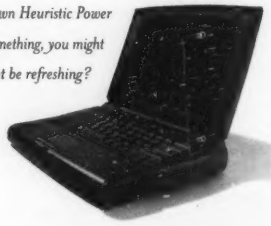
Observers said Digital's continuing woes result from its inability to execute a constantly evolving turnaround strategy. This past year, the company pared its workforce, instituted a wholesale reorganization of its sales force and cut prices aggressively on key products.

Some of the moves succeeded in putting a lid on costs, pushing up margins slightly, cutting product inventory and reducing distribution channel conflict. But the company's efforts to increase product sales have continued to stumble, observers said.

"They have the right focus, but the general feedback we get is that things are still a bit rocky out there," said Greg Casto, president of DDA, the association of the Digital marketplace. The Urbana, Ohio-based organization represents more than 80 channel partners and IS organizations. □

WITH seven hours of battery life, the AcerNote Nuovo makes other portables suddenly seem not so portable.

The AcerNote™ Nuovo™ has a single battery that lasts for over seven hours, making it pretty much the only portable that truly stays portable. Besides offering the longest battery life of any notebook, the Nuovo also has a Pentium® processor with MMX™ technology and Acer's own Heuristic Power Management. So whenever you open a Nuovo to work on something, you might actually—believe it or not—be able to finish it. Wouldn't that be refreshing?*



MMX intel inside pentium PROCESSOR

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Oracle vs Informix

The key feature of a "universal" database is the ability to manage any type of data - tables, text, audio, video, etc. The key question is: if a large number of datatypes are not supported natively by the server, how easy and safe is it to extend that server with new datatypes?

	Oracle® Universal Server	Informix® Universal Server
Tables	**Native Support**	**Native Support**
Text	**Native Support**	**Third Party DataBlade**
Audio	**Native Support**	**Third Party DataBlade**
Video	**Native Support**	**Third Party DataBlade**
Spatial	**Native Support**	**Third Party DataBlade**

Oracle® Universal Server has powerful native support for most every datatype. In contrast, Informix requires you to program or buy third party developed datatypes that they call DataBlades. Amazingly, a mistake in the DataBlade code can shut down the entire server and may cause you to lose all your data, according to Michael Stonebraker, Chief Technology Officer at Informix®. What? Are you kidding?

So if you're a gambler, call the Informix datablade casino in Vegas–1-800-NO-DICE. Or, if you want to manage all types of data and keep it safe, **call Oracle at 1-800-633-1071, ext. 11118, or find us on the Web at http://www.oracle.com**

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All other company and product names are the trademarks of their respective owners. *As reported by Computergram, October 24, 1996.

Users skeptical about E-mail outsourcing

▸ *CompuServe division to beta-test new service*

By Kim Girard and Bob Wallace

COMPUSERVE CORP. this month will begin beta-testing a service that lets information systems managers outsource their Microsoft Corp. Exchange-based messaging systems.

But some users said they would be reluctant to entrust mission-critical electronic mail to a third party.

CompuServe Network Services, Inc. will offer the as-yet unnamed service internationally from server farms and storage equipment in the Hilliard, Ohio-based company's wide-area network, company executives said last week (see chart).

MCI Communications Corp. is beta-testing a similar service but won't release general availability dates. Fabrik Communications, Inc. in San Francisco already offers a public Exchange service.

To use the service, employees can either dial in to CompuServe's servers to download information or use a dedicated line, depending on how much traffic their company handles. The service was designed to be less expensive than the private approach, but pricing hasn't been disclosed.

"I would never feel comfortable putting our mail off-site," said Karen Alonardo, network services manager at Electronic Arts, a video game company in San Mateo, Calif., that has 1,500 Exchange users worldwide. "For anything like E-mail that's so mission-critical, it needs to be accessible to us 24 hours a day, seven days a week.

"There's a confidentiality issue as well when other systems people who don't work at your company have complete access to your software," she added.

Larry Sikon, director of technical services at Montgomery Securities, an investment banking and trading firm in San Francisco, shares her concerns.

"We treat E-mail as a mission-critical application," he said. "It's not a thing we'd outsource."

Sikon said he doubts a service provider or carrier could prioritize service on the fly the way his company does.

TRICKY TASK

Using a public Exchange service may work for smaller companies that don't have the resources to invest in making their system work, said Tim Sloane, director of messaging applications research at Aberdeen Group, Inc., a consultancy in Boston. Setting up Windows NT and Microsoft Exchange in multiple offices is "extremely tricky to do" because of the need to link multiple directories and user names, he said.

"If you don't know what you're doing, you're most likely going to dig yourself into a hole," Sloane said.

But corporations risk losing control over their systems and their private internal information if they outsource, Sloane said. "I've yet to meet a Fortune 100 company that doesn't look at their E-mail system as a strategic asset. I don't think there's a snowball's chance in hell" those companies will outsource, he said.

Erik Iversen, director of application development at Nabisco Corp. in Parsippany, N.J., said his company has investigated the possibility of using a public service to manage some of the traffic generated by the company's 6,500 Exchange users.

"The service would have to be both robust and secure," Iversen said. To date, the firm hasn't found a provider that can meet those requirements, he said. □

COMPUSERVE'S PUBLIC EXCHANGE SERVICE

Competitors: Fabrik and MCI

Related services: CompuServe offers public Notes service

Offered from: Hubs in Columbus, Ohio; Seattle and London

Availability: In beta this month

Pricing structure under consideration: Usage, per-seat, per-server charges

Oracle's Ellison floats proposal to pluck Apple

By Lisa Picarille

ORACLE CORP.'S outspoken chairman, Larry Ellison, last week told *The San Jose Mercury News* that he is trying to pull together a group of investors who will decide soon whether to bid more than $1 billion for troubled Apple Computer, Inc.

The group reportedly would pay Apple shareholders about $1.25 billion in cash for a 40% equity stake in Apple, based on current share price and outstanding number of shares. That would bring the total value of the deal to $2.1 billion.

Apple's revenue last year was more than $9 billion.

Earlier this month, Ellison was quoted as saying he would be willing to help Apple cofounder and billionaire buddy Steve Jobs if he wanted money to take over Apple. More than a year and a half ago, Ellison also publicly expressed an interest in buying Apple but never progressed further than that.

"We have no comment on Larry Ellison's remarks," said Katie Cotton, an Apple spokeswoman. Ellison couldn't be reached for comment.

The market reacted positively to the news of Ellison's possible takeover. Apple's stock rose more than 11% (or 1 7/8) to close at 18 5/8 on Thursday.

FEEDBACK SOUGHT

Ellison has set up an electronic-mail address (saveappleus@oracle.com) to get feedback on the proposal from users, stockholders and the industry.

Charles Wolf, a financial analyst at Credit Suisse First Boston, an investment banking firm in New York, said that for Ellison's bid to be successful, he must offer shareholders at least 25% more than the current share price, which was hovering at about $16 when Ellison floated his takeover trial balloon.

But other analysts said Ellison's statements could spark a bidding war for Apple. According to analysts, the list of companies with the money to buy the Cupertino, Calif.-based computer maker is short and includes IBM, Sun Microsystems, Inc., Microsoft Corp. and Hewlett-Packard Co.

The only public offer for Apple was from Sun, which was spurned when it approached Apple in 1995 about a merger. □

Monitoring tool helps IS be users' Big Brother

By Patrick Dryden

INFORMATION SYSTEMS managers will soon be able to view from the Veranda user activity for all types of messaging — electronic mail, network fax and Internet.

Tally Systems Corp. in Hanover, N.H., will complement its desktop inventory and software management tools when it rolls out Veranda Enterprise Messaging Reporter next week at the Electronic Messaging Association conference in Philadelphia.

For the first time, managers of messaging applications or security will be able to monitor usage of diverse resources through a single database. That simplifies tasks such as chargeback, audits and capacity planning — not to mention snooping for employee misuse.

"I like the idea of one console to monitor all of our E-mail systems. That would definitely cut the time to find a problem and generate one chargeback bill," said Ben Marshall, a systems programmer at United Services Automobile Association, an insurer in San Antonio.

Central IS managers need a unified technology instead of separate reporting tools, said David Ferris, president of San Francisco messaging consultancy Ferris Research, Inc. Various products provide similar reporting functions, and some tools, such as Patrol from BMC Software, Inc., can manage multiple applications. But nothing competes with Veranda, Ferris said.

"Veranda looks valuable for covering multiple mail systems as well as extending to fax and Internet usage," he said. That allows IS to better plan messaging service, anticipate problems and unify chargeback, he said.

But the unique tool's Big Brother capability may stimulate more interest.

For individuals or departments, Veranda can track usage by volume, duration, destination and time of day. Managers can quickly reveal the E-mail hogs, Internet loafers and security risks, such as those who send resumes or files to competitors.

While demonstrating Veranda to corporate clients, "We've stayed away from the negative aspects, that employees may be misusing resources. But those questions come up nine times out of 10," said beta tester Michael Streib, sales vice president at Computer Bank, Inc. in Indianapolis.

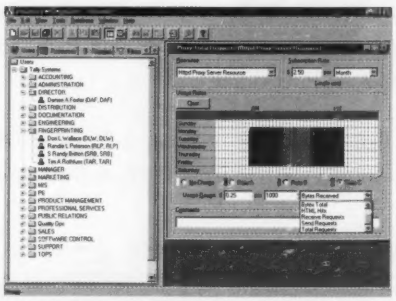
That's because IS managers "are beginning to figure out that they are the focal point for supporting corporate legal responsibility," said Tim Sloane, director of messaging applications research at Aberdeen Group, Inc. in Boston.

Veranda can help them "enforce policies about use of corporate assets like E-mail communication or Internet access," Sloane said.

A potential drawback is Veranda's reliance on a proprietary scripting language and database, which gather statistics from the log files in diverse messaging systems. Users just specify the path to the logs for 25 popular messaging packages. But the initial lack of native support for other products means users must translate some data themselves.

Also, optimal performance for Veranda's database peaks at approximately 7,000 users, according to Tally.

Pricing starts at $2,995 for 50 users. □



From Veranda, managers can monitor each department's E-mail, network fax and Internet activity to unify billing and audit usage

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'Database lite' holds no weight with users

By Craig Stedman

ORACLE CORP. this summer will try to put some mobility in network computers by porting its lightweight database for remote users to thin-client devices.

But the network computer evangelist faces a hard sales job on this one with corporate users.

The database will let network computer users cache data for use while disconnected from networks, Oracle officials said. Mobile users equipped with laptop-like network computers could then run transactions through either a live modem connection to back-end databases or a wireless store-and-forward capability that is being added to the PC version of Personal Oracle Lite this week.

But even loyal Oracle users who are keen on the network computer concept said they are skeptical about the value and technical feasibility of equipping salespeople and other roaming employees with mobile thin-client devices.

PIPE DREAM

"I think it's an Oracle pipe dream," said Karl Gouverneur, director of technology architecture at Uarco, Inc. in Barrington, Ill. Uarco, which prints business documents, has installed 400 network computers and turned 400 PCs into thin clients. But Gouverneur said he views network computers "primarily as a presentation tool and an end-user interface, not something to run a database."

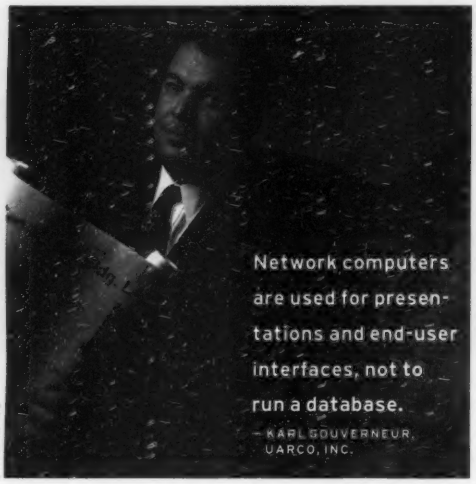
Replicating data from corporate databases to mobile network computers also could present "a big, big challenge," Gouverneur said. "It's difficult to replicate databases. That's why sales force automation has such a high failure rate."

Oracle, in Redwood Shores, Calif., first broached the idea of a network computer version of Personal Oracle Lite last fall [CW, Oct. 14, 1996]. Last week, Oracle officials said specific plans will be announced in June, with shipments due by September.

The mobile database costs $195 on PCs, but Oracle plans to bundle the network computer version with its NC OS operating software, said Denise Lahey, senior director of Personal Oracle Lite.

Some unspecified functionality will be dropped to reduce the database's footprint below the 1M byte of memory and 2.5M bytes of disk space required now, she said.

Hugh Allan, manager of information technology at Dunlop Tire Co. in Amherst, N.Y., said a mobile network computer sounds intriguing in terms of cost. "But I don't see it being a good fit for our needs," Allan said. □



JEFF SCIORTINO

Smart-card standard set

By April Jacobs

FOUR MAJOR VENDORS last week released the first standard for using smart cards as access devices for network computers.

The coalition members are IBM, Netscape Communications Corp., Oracle Corp.'s Network Computer, Inc. (NCI) and Sun Microsystems, Inc.

The smart card technology is for roaming network computer users who don't have laptops but need to access applications and files while on the road.

The standard, called OpenCard Framework, will enable vendor-independent cards to be given to users so that they can log on to any manufacturer's machine, according to Mary Ann Davidson, a product manager at NCI.

Users with smart cards will be able to plug them in to network computers and access their company's network based on preset privileges.

Larry Garden, information systems manager at Brewers Retail, Inc. in Mississauga, Ontario, said the firm is considering smart cards for its point-of-sale machines throughout Canada. □

COMPUTERWORLD

For these and other related links, point your browser at *www.computerworld.com/links/97033smartlinks.html*

►Smart Cards: Readings and Resources: *www.iat.unc.edu/guides/irg-35.html*

►The Smart Card Forum: *www.smartcrd.com/*

►The Smart Card Club: *www.smartcard-club.co.uk/home.html*

Laptop thefts escalate

CONTINUED FROM PAGE 1

In fact, laptop theft — and accompanying loss of data — is reaching epidemic proportions.

The value of stolen laptops hit $805 million last year, a 27% increase from 1995, according to the Safeware Insurance Agency, Inc. in Columbus, Ohio. According to Safeware, 265,000 laptops were reported stolen last year, up from 208,000 in 1995 and 150,000 in 1994.

And 57% of 563 companies recently surveyed by the Computer Security Institute (CSI) reported that they have been victimized.

"Laptop security is probably the hottest issue right now in the mobile sector," said Ken Dulaney, an analyst at Gartner Group, Inc. in San Jose, Calif. "It's what all the users are worried about."

DATA LOSS

Even more worrisome than hardware loss is the theft of data, said Richard Power, a spokesman for CSI.

"The numbers of theft are so high. ... I think there is something more going on here," Power said. "I don't think they are all being stolen just for the hardware — there is a growing aftermarket for the data as well. The laptop might be worth a few thousand dollars on the street after theft; the data could be worth $80,000."

"Or someone could break in to a hotel room, use a laptop to download information, then leave the laptop. The owner wouldn't know data had been stolen," he said.

Power said unconfirmed rumors abound of Internet sites that offer bounties for the laptops of particular CEOs.

Leslie Fiering, a Gartner Group analyst, said while she doubts thieves are going after laptop data, users are becoming increasingly concerned.

"More and more, big deals and market information, bids, all sorts of a company's proprietary information is stored on the laptop," Fiering said.

To play it safe, she recommended that IS managers secure the hardware, protect the data and data transmission and authenticate access to the network. She also advised clients to lock down offices or lock the laptops to docking stations, use identification alarms and use encryption software for data (see story below).

In the future, smart cards and voice recognition technology could aid in authentication for network access, she said.

But the biggest issue is awareness. "Companies need to make sure their users understand how valuable these devices are and how vulnerable they leave the enterprise," said Charles Cresson Wood, a security consultant in Sausalito, Calif.

"What constantly frustrates us is the stupidity," Erwin said. "People are leaving them on car seats, in washrooms. And they wonder why it's stolen. There are criminal rings out there that use these laptops as a tool and will snap them up."

Bart Everett, deputy systems editor at *The Los Angeles Times*, said laptops disappear "out of cars, or people will say they lost them. We have to make users aware of the dangers." □

Guard against losing your laptop

The theft late last year of a laptop from Visa International, Inc.'s San Mateo, Calif., office illustrated how lax some firms can be in protecting laptop data, industry analysts said.

The laptop contained 314,000 credit-card numbers, including those of Visa, MasterCard and American Express. Most of the card issuers were given replacement numbers, but industry analysts wondered why the office didn't have policies against keeping such sensitive information on laptops. Several products on the market are aimed at providing laptop protection, including the following:

►Safe Guard Easy for Windows 95 from Mergent International, Inc. in Rocky Hill, Conn. This software provides access control and data encryption. Pricing wasn't available.

►CompuTrace from Absolute Software, Inc. in Vancouver, British Columbia. The product sits on computers and reports its location via modem. It can withstand such procedures as hard disk formatting. The service costs about $60 per year.

►Net Wallet, a PC Card from Telequip Corp. in Nashua, N.H. The card can store network passwords and private keys to guard against copying from World Wide Web browsers. The card starts at $275. — Mindy Blodgett

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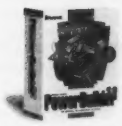

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Sun to spread Java beyond computers

By Sharon Gaudin

SUN MICROSYSTEMS, INC. is moving ahead on its vision of spreading Java beyond what people generally think of as their computers — and embedding it in devices throughout their homes and automobiles.

The three versions of the Java Development Kit (JDK) will include Personal Edition for personal and network computers, television set-top boxes and telephones; Embedded Edition for networked printers and appliances such as air conditioners; and Card Edition for smart cards.

CONFERENCE HIGHLIGHTS

A Sun spokeswoman said the company will officially announce its plans at its second annual JavaOne conference this week in San Francisco.

Sun also confirmed reports that it will offer a new framework for server applications. JavaBeans, a cross-platform architecture designed to work on the desktop, is being expanded to work on the server side.

The idea behind splitting the JDK into pieces is to better enable programs built with it to work on a wide variety of devices. The JDK Personal Edition, for instance, will come with a lightweight version of the Java Virtual Machine, which was designed to translate the Java code to the machine it will run on. The Personal Edition also will have a different set of class libraries.

HOT TREND

"Sun has been talking about moving Java beyond computers for a while," said Karen Boucher, director of The Standish Group International, Inc. in Dennis, Mass. "If they want Java to work on everything from smart cards to toasters to air conditioners, that's going to be tough using one JDK. They all work so differently it only makes sense to have different versions of Java."

The announcements come as excitement gears up for the JavaOne conference. The cross-platform Java language and the technologies built with it have become one of the hottest trends in the industry.

Computerworld reported last week that Sun is merging its JavaBeans architecture with the platform-independent Common Object Request Broker Architecture middleware.

Users and analysts hailed the surprise move as one that could help them solve their cross-platform migration problems. □

IBM MAINFRAME REVENUE

As mainframe hardware gets less expensive, IBM is counting on software sales to prop up its revenue

	1996	1997
Mainframe hardware	$6.7B	$6.5B
Mainframe software*	$10.6B	$11.8B

*Includes OS/390 and other S/390-related software

Source: Annex Research, Phoenix

Software costs trap mainframers

CONTINUED FROM PAGE 1

That is because a new machine would propel Group Health into a higher pricing bracket for its mainframe software.

"If we don't get control of software, it will be software cost per MIPS that kills mainframes," said Mike Kelly, chief information officer at the Chicago Mercantile Exchange.

ONE-SIDED

Although mainframe hardware costs are plummeting, users aren't seeing similar movement in mainframe software utilities and applications.

For example, Aberdeen Group estimated that mainframe hardware prices have dived from more than $100,000 per MIPS in 1990 to less than $10,000 per MIPS this year.

But while users five years ago spent three times more on mainframe hardware than they spent on software, now that ratio is equal.

That shows that more attention must be placed on creating more flexible software contracts, said Barry Graham, president of Smart Computing, a U.K.-based consultancy.

Vendors controlled mainframe hardware costs in the past few years by introducing air-cooled CMOS processors that require less space and energy to maintain, a mainframe clustering scheme to simplify capacity upgrades and a range of new systems to give users more than a one-mainframe-fits-all offer.

There are signs of hope for lower software costs this year.

IBM is rolling several of its MVS system software products into OS/390, the latest mainframe operating system, without raising the price, said Kevin Cleary, manager of S/390 business analysis and strategy at IBM.

And some third-party vendors that are porting Unix applications to OS/390 this year — SAP AG, Oracle Corp. and J. D. Edwards & Co. — will charge the same price for OS/390 versions that they charge for Unix versions, said John Cianci, IBM's director of solution provider programs.

IBM and Computer Associates International, Inc. offer MIPS-based pricing, or enterprise deals, as options to the traditional tier-based pricing that is tied to the size of the processor, not the use of the applications.

Analysts say these efforts are laying the groundwork for true usage-based pricing in the future.

"In some instances, we have far more pricing plans now than we have had in our history," said Rich Chiarello, CA's senior vice president of North American sales. □

& **Mainframe shops slowly moving to parallel sysplex. Page 45**

Few options to cut mainframe costs

There are currently few avenues for users who are struggling to cut mainframe software costs.

Some users try to play competing vendors off one another. But that is a rare opportunity in a market in which analysts say IBM supplies about 50% of the software in each data center.

Others buy more software in the form of auditing tools to curb software costs.

For example, Blue Cross/Blue Shield of Minnesota used Isogon Corp.'s SoftAudit to identify products that could be removed from the mainframe, then monitored others for usage levels.

"From there, we negotiated MIPS-based or user-based contracts," said Alan Bain, a senior technical specialist at the health system's Eagan, Minn., data center, saving 25% of Blue Cross' software budget. — Tim Ouellette

Monitoring tools needed

CONTINUED FROM PAGE 1

that can turn "techie trivia into information that helps us get coupons out the door."

Organizations trying to establish SLAs haven't been able to do a complete job "because they can't monitor the response time, throughput and other details specific to different user groups" — data that is needed to back up SLAs, said John McConnell, president of McConnell Consulting, Inc. in Boulder, Colo.

"Defining service-level expectations is hard enough, but it's far more difficult to monitor performance," according to Charles Hebert, president of Southernview Technologies, Inc., a management consultancy in Kennesaw, Ga.

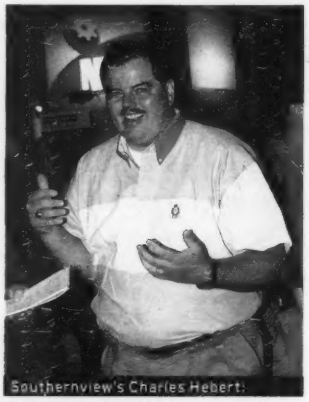
Hebert is assembling tools to monitor networks and systems throughout Time Warner, Inc. in New York, primarily for availability but also to determine if each division's service needs are met.

"Back in the mainframe world, you tracked service by screen response. But in a distributed environment, all the servers, networks and middleware between IS and the end users make measurement tough," Hebert said.

Central managers are forced to react to red alerts and irate phone calls instead of taking charge as proactive service providers.

"Before users complain, I'd rather tell them we notice their performance is slowing and that we're working to improve it," said Mike Bannon, communications manager at Mercy Health System in Bala Cynwyd, Pa.

Help is on the way. 3Com Corp. in Santa Clara, Calif., and Hewlett-Packard Co. in Palo Alto, Calif., this week will announce support for service-level management. And Optimal Networks Corp. in Palo Alto will launch a unique tool to debug performance problems of client/server applications that run across enterprise networks (see story, page 17). Service-level management sits at the far end of everyone's road map, but this week's announcements promise some concrete steps toward that goal, said Elisabeth Rainge, an analyst at International Data Corp. in Framingham, Mass.



Southernview's Charles Hebert: **Time Warner is calling for a production system in July to monitor network, system availability and service. But "performance measurement is tough."**

BETTER MONITORING

3Com will boost its users' performance monitoring capability by adopting the SLA Conformance Management system from newcomer InfoVista Corp. in Redwood City, Calif. InfoVista's tool costs $20,000. It gathers statistics from many vendors' devices into a central database. It then provides reports and alerts about the performance users experience.

3Com will sell and support InfoVista's monitor in June with modules customized for its gear.

By early next year, 3Com plans to enable its internetworking hardware and software to adjust bandwidth automatically to guarantee performance stipulated by SLAs.

HP will unveil the OpenView IT Service Management initiative, a program that joins its tool and services divisions to better support user attempts to define and meet SLAs. □

Tool helps to plan as apps go from LAN to WAN

▸ *Optimal Networks' analysis software can help cut costs*

By Patrick Dryden

ALL TOO OFTEN, vital applications developed on a LAN choke when they are rolled out across a campus or wide-area network.

And every day, network managers must fend off user complaints about poor performance.

Optimal Networks Corp. in Palo Alto, Calif., this week will introduce a graphical analyzer to help application developers and managers of distributed systems and networks scrutinize client/server transactions. The unique Application Expert software slashes the time and expertise required to decipher complex application activity, beta users said.

"This took a lot of mystery out of the black art of application performance analysis," said Mark Stokes, senior design engineer at Omaha-based Inacom Information Systems, Inc. "It's dramatic what we can do in a short amount of time."

Contracted by a manufacturer to tune a 460-site intranet, Stokes used Application Expert to isolate an addressing problem that caused a sixfold delay for some users trying to access a central database.

It took about 40 hours to do a frame-by-frame analysis of WAN performance data by using traces from a protocol analyzer, he said. "Now I can do even better work in one day. So this task costs my client $800 instead of $40,000," he said.

The tool captures the packets exchanged between a single client and its servers, graphically revealing activity over time. It also summarizes transaction delays within the client, at all servers and across the network, and lets the user test the impact on performance of changes.

COST SAVER

That capability helped prevent a costly and unnecessary WAN bandwidth upgrade, said John Pittas, systems officer at ABM AMRO Bank in Chicago.

Response time for a Lotus Notes application at the bank had plunged from 30 seconds on a LAN to nearly three minutes for new users on the WAN.

Application Expert revealed activity that helped developers redesign their server access methods, Pittas said, and "helped me prove that we would have needed [a Fiber Distributed Data Interface] ring between here and Toronto to increase performance."

Application Expert can help developers become network-aware earlier in the design process and help network managers "prove the network isn't broken," said Bryan Bates, a senior analyst at SupportNet Consulting, Inc. in Calgary, Alberta.

Now these two groups can work together more easily "to get applications deployed quickly and working efficiently and prevent embarrassing failures," said Joseph Baylock, director of research at Gartner Group, Inc. in Stamford, Conn.

"At so many client briefings, network managers and application developers sit on opposite sides of the table and can't talk," Baylock said. "Application Expert is a big step because it introduces a common discussion point."

The software requires a PC running Windows 95 or Windows NT with at least 32M bytes of memory and a network connection. It costs $15,000; a limited version for developers costs $5,000.

Application Expert requires additional tools from Optimal Networks to really help information systems managers roll out client/server applications, analysts said. "They can really break down one client's activity to show what takes the time," said John McConnell, president of McConnell Consulting, Inc. in Boulder, Colo. But without the rest of the modeling tools, they can't project the impact on a network from extending that application to hundreds of users, he said. □

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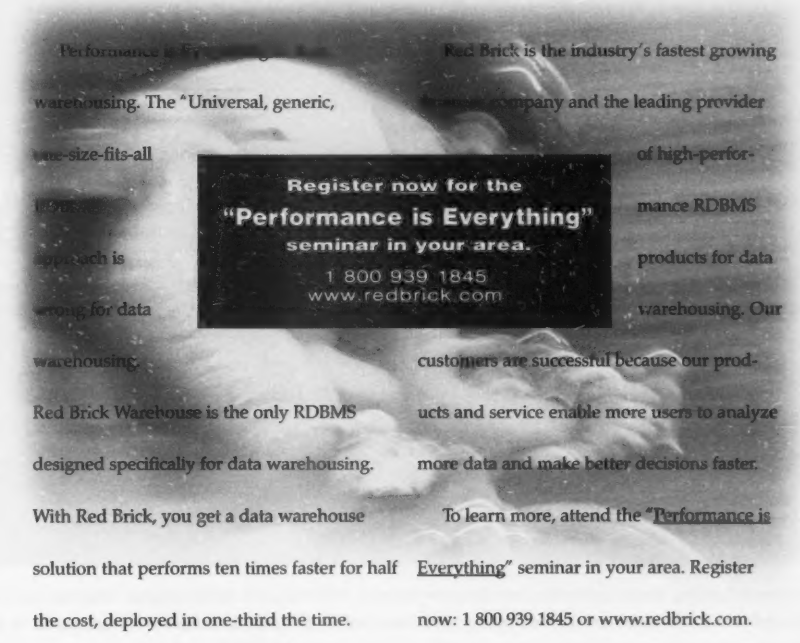

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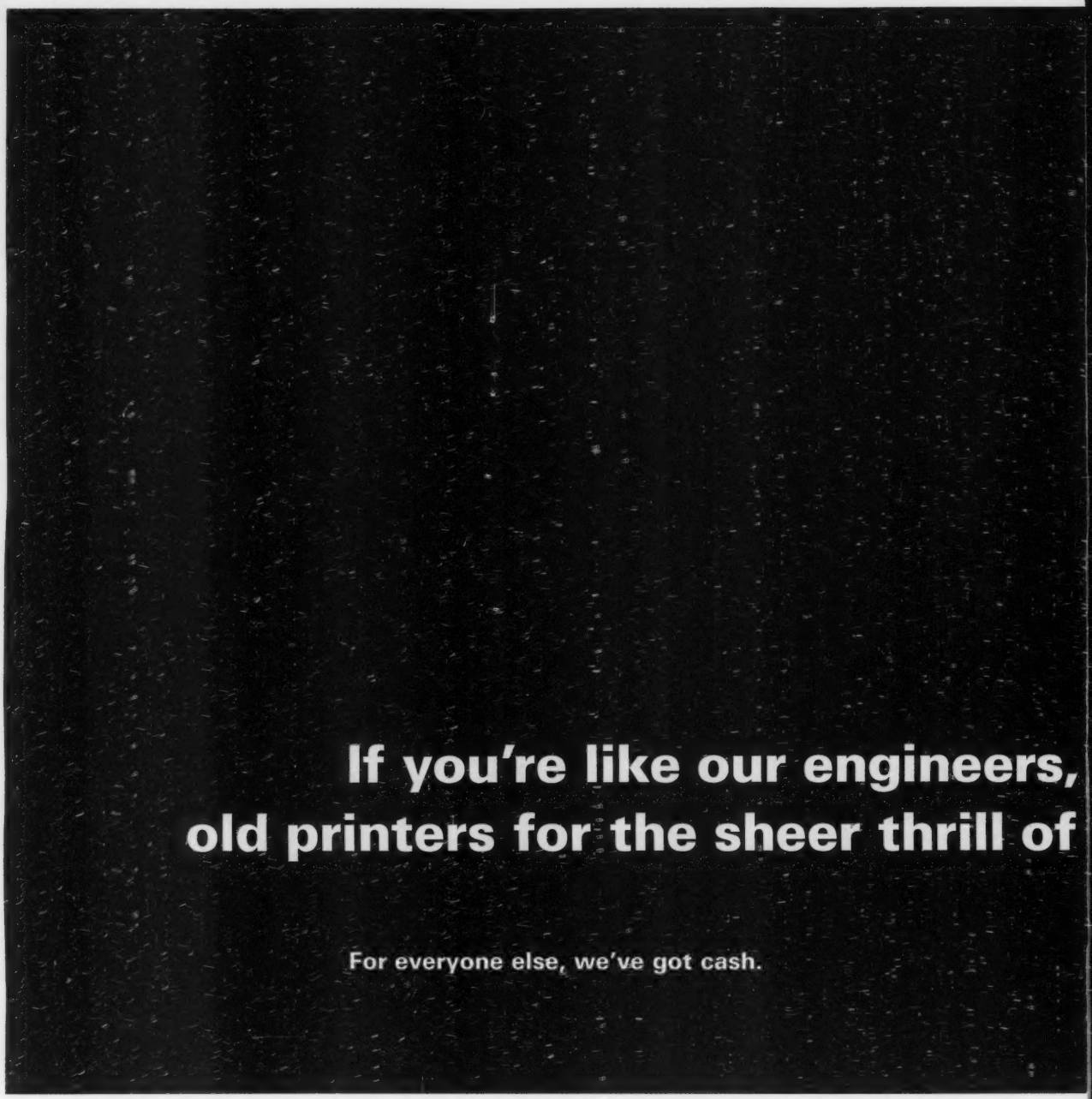

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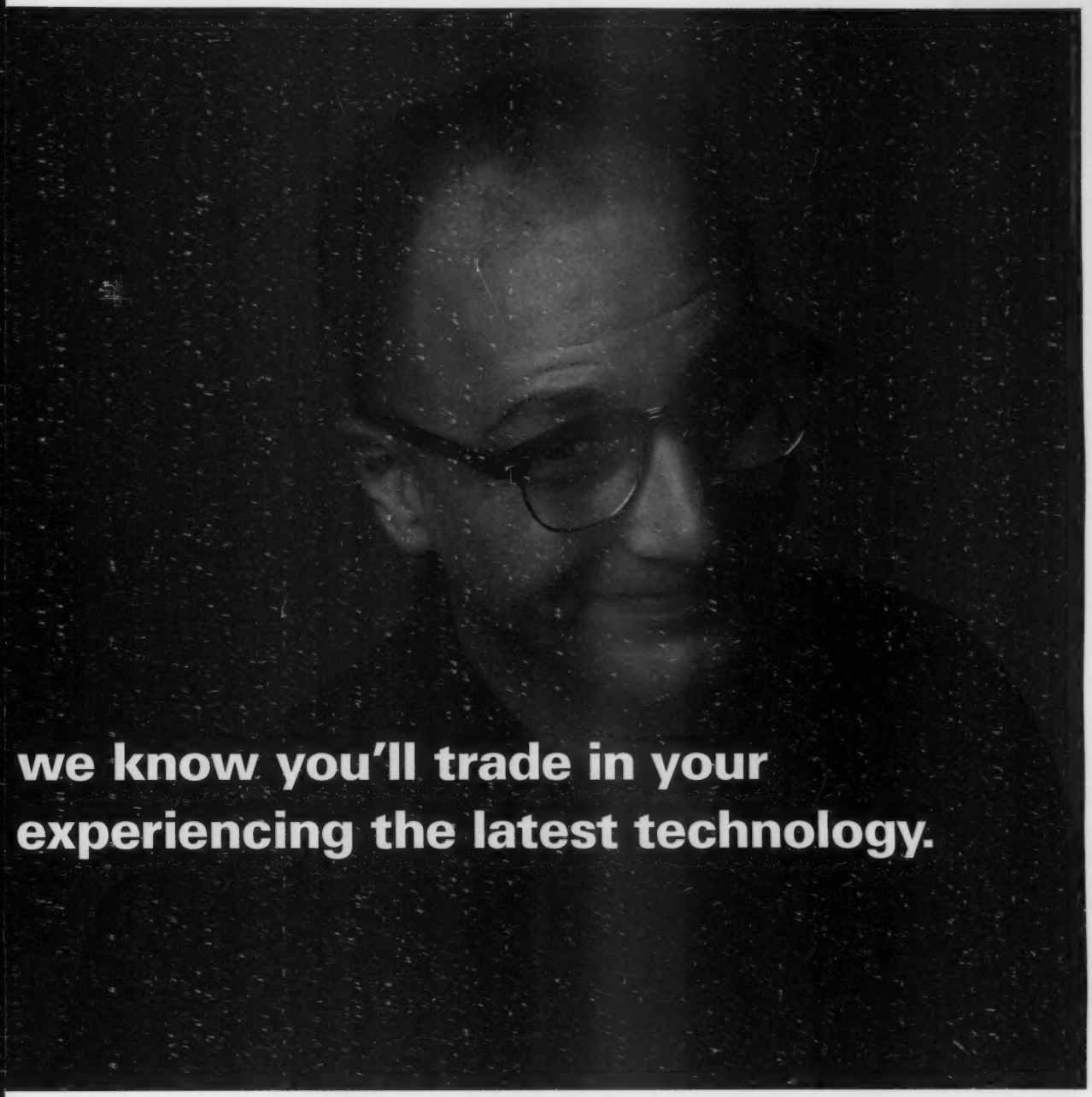

HEWLETT PACKARD

Andersen Consulting faces malpractice suit

By Thomas Hoffman

IT'S OFF TO federal court next week for a $31.5 million lawsuit over an Andersen Consulting systems integration project gone sour.

Beverly Enterprises, Inc., the nation's largest nursing home operator, has charged Andersen Consulting with fraud and professional malpractice for allegedly inflating and hiding the costs of an expensive, ill-fated client/server system.

The case, which will be heard in U.S. District Court in Beverly's hometown of Fort Smith, Ark., centers on a September 1994 contract in which Andersen reportedly agreed to implement an off-the-shelf, client/server business office system for patient admissions, accounts receivables and other functions.

Beverly is seeking to recoup $11.5 million it paid to Chicago-based Andersen and $20 million in punitive damages, according to court documents obtained by *Computerworld*.

Washington lawyer Tobey B. Marzouk, who represents Beverly, said the company's complaint includes the following allegations:

- Andersen inflated the cost of the third-party software by "misleadingly" multiplying the cost of a single-unit license by Beverly's 770 facilities without factoring in volume discounts.
- Andersen "improperly committed" Beverly to licensing nearly $2.5 million worth of software from Oracle Corp. and Andersen — on a nonrefundable basis — even though work on the system was discontinued.
- Andersen failed to inform Beverly about systems maintenance costs, including the 770 part-time systems administrators who would be needed to monitor the network at an estimated cost of $6 million to $7 million per year.

When the project began to stumble, Beverly dismissed Gary Weatherly, its vice president of MIS, in November 1995 and hired Barry Ganley as its chief information officer, sources said. Later that month, Ganley halted the Andersen contract.

In June, Beverly signed Bellevue, Wash.-based Care Computer System, Inc. to a $3 million contract to deliver two systems: a business office system and a clinical resident care system. Those systems are being rolled out now.

An excerpt from the complaint filed by Beverly Enterprises:

Andersen Consulting "improperly committed Beverly to acquiring software even though the business office system project was delayed and then terminated."

A spokeswoman for Andersen claimed Beverly canceled the project the night before the rollout was scheduled to commence in November 1995. "We never received or heard a complaint [from Beverly] prior to them canceling the project," she said. Andersen isn't countersuing Beverly but is seeking to collect on fees it claims Beverly hasn't paid, the spokeswoman added.

Industry analysts weren't familiar with the Beverly project, but several said the legal battle may have something to do with Beverly's change in information systems management.

"When you have a change in buyer management, the new manager often has a different agenda than the former manager, such as an inclination for a cost-oriented contract vs. a value-oriented deal," said George Logemann, an analyst at The Yankee Group in Boston. □

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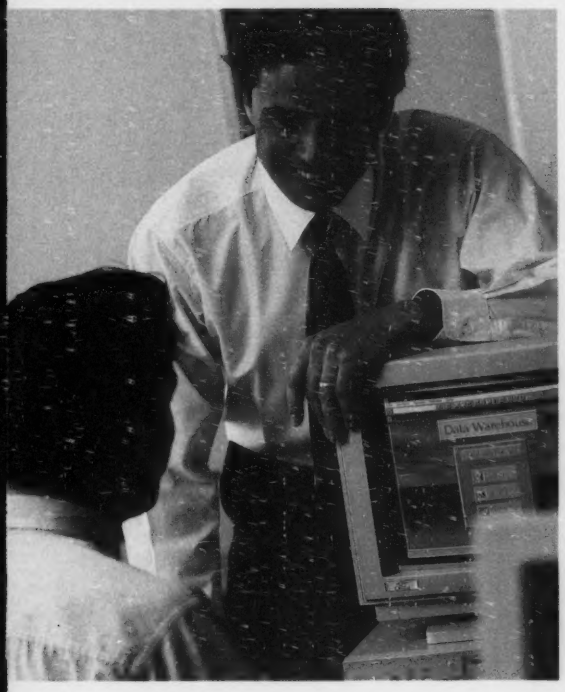

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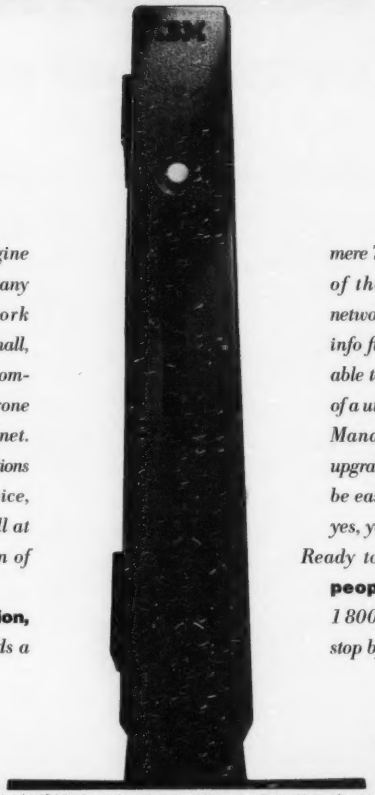

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Back to the classroom

▶ *Graduate program offers vendor-neutral networking courses*

By Julia King

THE INTEROP GRADUATE INSTITUTE in Foster City, Calif., next month will launch a graduate-level education program designed to broaden the expertise of networking professionals beyond a single vendor's networking technology.

The initial program will comprise six four-day courses on topics such as network protocol design, routing protocols and scientific methods for measuring Internet traffic.

What differentiates the courses from most other training and certification programs is their vendor-neutral status, said Kathryn Swafford, general manager of education and training at Interop.

1996 network operating system unit shipments

NetWare	1.1 million
Windows NT	720,000
Unix	606,000
OS/2 Warp Server	350,000
Other	307,000

Source: International Data Corp., Framingham, Mass.

"In most large organizations, you have every networking technology from soup to nuts," Swafford said. That creates a need for professionals whose expertise extends beyond Novell, Inc.-based networks, for example.

REALITY CHECK

"I think that corporate networking managers would be very interested in a vendor-neutral training environment because they're going to get more of a reality check," said Linda Musthaler, vice president of research at Currid & Co., a networking consultancy in Houston.

"The problem with strictly vendor certification is that it doesn't address cross-vendor integration issues," Musthaler said. "Yet very often, companies have defined one network for file-and-print services and another as an application platform, and they need to get the two to talk together."

"Having a general understanding of WANs, [Asynchronous Transfer Mode] and Fast Ethernet would be very, very helpful," agreed Tony Macaluso, director of information technology at Multicare Companies, Inc. in Hackensack, N.J.

FUTURE IS HETEROGENOUS

Most companies operate a heterogenous networking environment, Macaluso said. And even those that don't operate that way now may do so in the future, given the increasing number of mergers and acquisitions across all industries, he said.

Macaluso said he would "absolutely be willing to pay a [salary] premium" to networking professionals who have cross-vendor skills, especially in the wide-area networking arena.

The courses also were designed to teach professionals how to assess networking technologies as they develop, according to Swafford.

Tuition for each of the six courses, which are scheduled to begin April 21 in Palo Alto, Calif., is $1,699. Subsequently, the courses will be held at other locations nationwide and over the Internet, Swafford said.

Separately, the Interop Graduate Institute is working on securing university accreditation for the courses, which were designed for professionals who have been in networking jobs for three to five years.

A college degree isn't required to enroll in the graduate-level courses, but students are expected to know how to program in C++ and have some knowledge of internetworking, Swafford said. □

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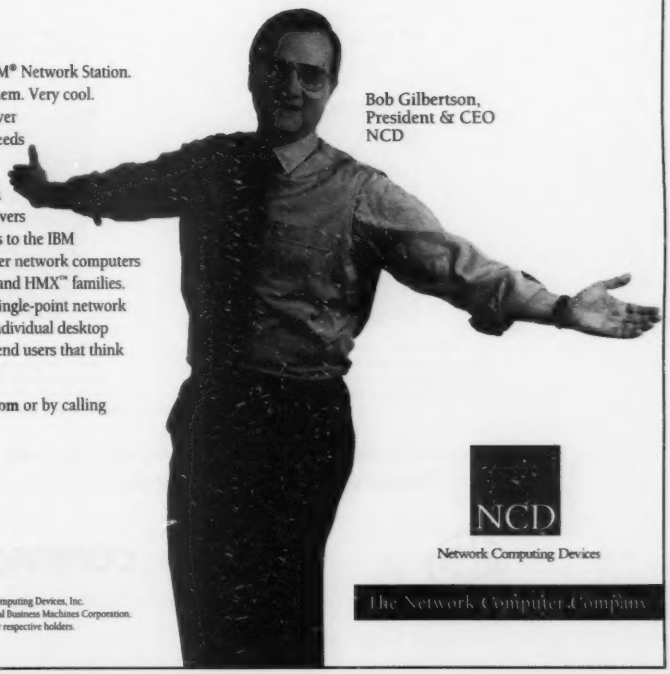

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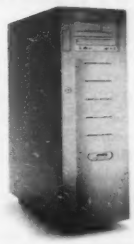

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EMC targets online users

▸ *High-end disk maker to offer Web services*

By Tim Ouellette

AFTER TAKING a lead in the high-end disk storage market, EMC Corp. wants to get its hands on users' World Wide Web data.

This week the disk storage market leader will branch out into Web hosting services when it unveils the Web Site Management Service. The service promises to provide users with high-speed access to their Web site content along with continuous access.

The new service — which will host Web sites and store users' Web site data on EMC's high-speed Symmetrix disk arrays — will include an array of features, all located at EMC's facilities in Hopkinton, Mass. (see chart).

Users will be responsible for site content creation.

INSTALLED BASE KEY

Jim Fitzgerald, director of EMC's new Internet services division, said the target customers are companies with large data centers — its installed base — that know they will need numerous resources to manage their corporate Web sites.

For example, CompuServe Corp. uses EMC's service to manage the paid advertisements that appear on its Web pages. EMC manages the rotation and targeting of specific advertisements to certain types of CompuServe members.

"We needed a provider with this kind of expertise to manage data," said a CompuServe spokesperson at the firm's headquarters in Columbus, Ohio.

According to observers, users shouldn't discount a storage player entering the Internet space, even when it is competing against Internet service provider giants such as UUnet Technologies, Inc. and AT&T Corp., which provide similar services and run their own networks for customers.

Storage competitor IBM already acts as a service provider with its IBM Global Network, while other companies such as Storage Technology Corp. in Louisville, Colo., and Amdahl Corp. in Sunnyvale, Calif., provide consulting services in respective areas such as remote data vaulting and parallel sysplex.

"With companies that know them, I think EMC can make a convincing argument to be considered for a portion of their Web hosting business," said John McArthur, a research director at International Data Corp., a consultancy in Framingham, Mass.

"And at this point, what large data center doesn't know EMC?" he added.

EMC's Web Site Management Service is available and priced monthly, according to customer space requirements. □

EMC'S WEB MANAGEMENT SERVICE INCLUDES:

- Windows NT or Unix Web servers to host Web sites
- EMC Symmetrix disk array farms to store Web site content and data
- Continuous access to a subscriber's Web site via numerous T3 lines from different Internet service providers
- Services and staffing to set up, maintain and monitor the technical pieces of a subscriber's Web site

Storage Computer upgrades existing products, will unveil high-end servers

By Tim Ouellette

STORAGE COMPUTER CORP. this week will give users more data-center options by introducing two high-end products and bringing some high-end features to its existing storage offerings.

The Nashua, N.H., company will unveil the high-end 72-Series OmniRAID Servers and the 74-Series OmniRAID SuperServers/ES.

And existing 71-Series OmniRAID Servers will gain features that let users set data protection down to the data set level.

"They are scaling their line upward and putting it more in line with other products that compete for space in the large data center," said John Webster, an analyst at The Yankee Group in Boston.

The 74-Series OmniRAID SuperServer/ES can support up to 48 different hosts, store 4T bytes of data and includes optional multilevel, multisite mirroring.

Other features, which will also be available in lower-end models, let users decide which level of security they want, down to the transaction level, not just for all data stored on a particular disk drive.

At Lucent Technologies, Inc. in Warren, N.J., Storage Computer arrays are used to manage and test database applications.

They let us attach to the same data using physically different SCSI channels. So when we operate in a test environment, we can reach and read production data, though it does not affect our production environment," said John Amelia, a network engineer at Lucent.

"Going into a large data center these days, which is now most often a multihost environment, this flexibility is important," Webster said.

Because of Storage Computer's focus on microcode, controller and software enhancements to off-the-shelf hardware, Webster likened the company to its much larger competitor, EMC Corp. in Hopkinton, Mass.

Prices for Storage Computer's disk arrays range from $65,000 to $3 million. □

> Storage Computer is "scaling their line upward and putting it more in line with other products that compete for space in the large data center."
>
> — John Webster, The Yankee Group

Consultancy puts year 2000 methodology on CD-ROM

By Matt Hamblen

DATA DIMENSIONS, INC. (DDI), a consultancy in Bellevue, Wash., last week announced a methodology tool aimed at solving the year 2000 problem.

Ardes 2K includes a CD-ROM and one year's connection to DDI's Internet site, where the company will provide frequent updates. The CD-ROM consists of hundreds of indexed entries designed to help an organization finish millennium work by the middle of 1999, assuming a plan is put into effect now.

"This product has the potential to save someone a lot of time in analysis of the problem and how to assess ways to deal with it," said a year 2000 project manager at a major telecommunications company, who asked not to be named. "It's not a fix or anything like that, but [it] is designed for attacking the year 2000 at 90,000 feet from the whole company standpoint," he said.

The manager said his company started to work on the conversion in 1995 but plans to use Ardes 2K "as another source of information to ensure we don't have any gaps and to help decide, 'Did we overlook something as we put it together?'"

The CD-ROM includes information that an information systems manager can show to upper management to dramatize the seriousness of the problem.

HOW TO CREATE A TEAM

It also has descriptions of how to create a year 2000 team, how to manage outside consultants and how to assess legal problems with conversions — including guarantees by software vendors. The Internet connection will update hardware and software products and provide some downloadable software, said Larry W. Martin, DDI's president.

Ardes 2K is similar to the year 2000 portion of The Systems Redevelopment Methodology (TSRM) from HCL James Martin, Inc. in Fairfax, Va., analysts said. That product costs $12,600 for five seats, while Ardes 2K costs $15,000 for five seats.

"DDI is a consulting company, so I don't understand why they are trying to make money selling a methodology," said William Ulrich, president of Tactical Strategy Group, Inc. in Soquel, Calif. TSRM is a "full-blown methodology with more than 125 software tools," he said.

But there is room in the market for a product such as Ardes 2K, according to Bruce Hall, research director at Gartner Group, Inc. in Stamford, Conn. "There are a lot of people still groping for a good method to address year 2000, and this type of product, if anything, causes you to be more efficient," he said.

CONFERENCE IN A CAN

Speaker and year 2000 consultant Peter de Jager, president of De Jager and Co. in Brampton, Ontario, called Ardes 2K a "conference in a can." "[It] is an attempt to bring everybody on a team to knowledge quickly." DDI has hired de Jager as a speaker, he said.

"Most organizations are in analysis paralysis right now, and anything to provide them stepping-stones will be welcome," de Jager said.

Dick Heiman, research manager for applied development tools at International Data Corp. in Framingham, Mass., said time to fix millennium conversions is short, meaning "there's a short market for a front-end product" such as Ardes 2K. □

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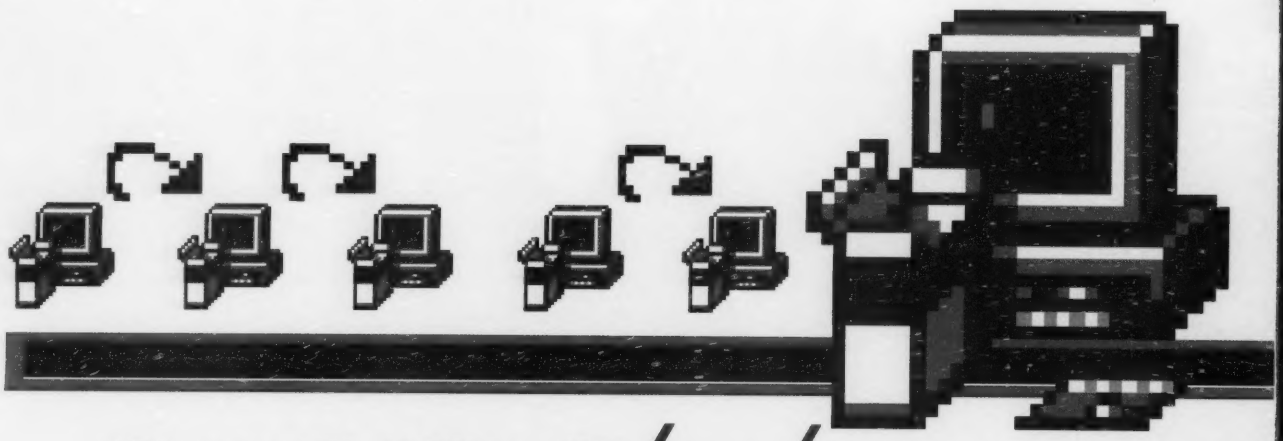

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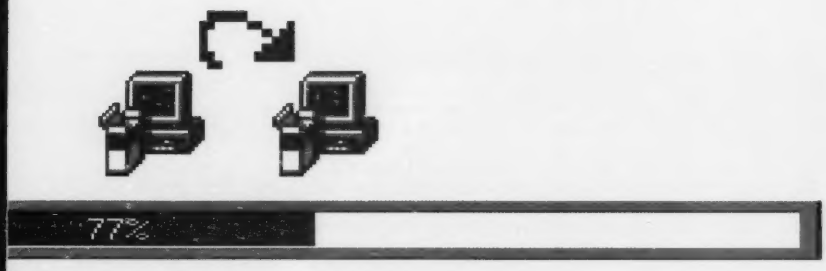

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Computer Industry

Briefs

Corel to play NC game

Corel Corp. last week reported earnings of $1 million for the quarter ended Feb. 28, compared with a loss of $6.6 million for the year-earlier period. Revenue rose 157%, from $36.4 million to $93.7 million. The Ottawa-based company added that it will spin off a subsidiary to make and sell network computers.

Intel investment

Intel Corp. has invested nearly $15 million to buy 6.75% of Avid Technology, Inc., a Tewksbury, Mass.-based maker of video and audio editing tools. Avid plans to expand its offerings for Intel-based computers.

Cisco buys DSL vendor

Cisco Systems, Inc., which bought Telesend, Inc. on March 3 in a stock swap, said last week it plans to integrate the San Jose, Calif.-based company's Digital Subscriber Line (DSL) technology into its Cisco network. Telesend's IDSL technology will allow speeds of up to 128K bit/sec.

McAfee marketing hire

McAfee Associates, Inc. in Santa Clara, Calif., has hired an Oracle Corp. veteran to manage corporate marketing and oversee its help desk and network management division. Zach Nelson, 35, is former vice president of marketing at database vendor Oracle in Redwood Shores, Calif., and director of corporate marketing at SunSoft, Inc., a division of Sun Microsystems, Inc. in Mountain View, Calif.

Motorola shuffle

Motorola, Inc. has named Merle Gilmore, previously head of the company's Land Mobile Products Sector, president of the company's Europe, Middle East and Africa region. James Norling left that position to become president and general manager of Motorola's Messaging, Information and Media sector. According to Dataquest, Motorola had 15% of the global market for cellular handsets last year, down from 25% in 1995.

SELF-SERVICE APPLICATIONS

PeopleSoft makes belated 'net move

By Randy Weston

PEOPLESOFT, INC. is finally adding its name to the long list of application vendors taking their products to the Internet.

The Pleasanton, Calif.-based company last week announced that its PeopleSoft 7 application package, due for release in next year's first quarter, will include a bundle of 15 self-service applications that can be deployed over a company intranet or the Internet. A beta version of the package will be released today.

"Up until now, we have engineered our applications for the functional user — people using the applications day in and day out," said Rick Bergquist, vice president of technology at PeopleSoft. "The key now is to push out those applications beyond the functional users to the casual users."

The self-service applications can be accessed through a World Wide Web browser running on a Java-enabled client or Windows. With them, employees can take care of minor tasks such as ordering office supplies, changing their address or checking on their benefits package without the information systems department having to deploy the software package on each desktop.

Some of the applications are also designed to let a company's vendors and customers check the status of orders or deliveries.

CALLING THIRD PARTIES

PeopleSoft also plans to hook up with third parties to extend the reach of its applications beyond a user's company. For example, through the self-service applications, an employee will be able to bring up information on his company's 401(k) plan directly from Charles Schwab & Co.

PeopleSoft competitors, led by Oracle Corp. in Redwood Shores, Calif., and German company SAP AG, with U.S. headquarters in Wayne, Pa., are about a year ahead of PeopleSoft on delivering Web-enabled applications.

Until now, PeopleSoft has relied on third-party vendors to build Internet-ready application programming interfaces for its products.

Adam Thier, an analyst at Meta Group, Inc. in Stamford, Conn., said PeopleSoft needed to catch up with its Internet strategy to stay competitive. "[PeopleSoft] is at a significant competitive disadvantage without this stuff," Thier said. "This goes a long way toward getting them at parity in the area." □

PeopleSoft's Web-enabled applications

Human resources

- Personal information update
- Job posting
- Training registration
- Electronic pay stub
- Dependent/beneficiary maintenance
- Benefits election review
- Spending account review

Financials/distribution

- Employee requisition entry
- Employee order status inquiry
- Customer profile updates
- Customer payment status inquiry
- Customer balance inquiry
- Vendor profile update
- Vendor payment status inquiry
- Vendor balance inquiry

Pretty Good Privacy buys Zoomit

▶ *Encryption vendor's acquisition opens door to metadirectory management across the network*

By Sharon Machlis

ENCRYPTION VENDOR Pretty Good Privacy, Inc. (PGP) last week acquired Toronto-based metadirectory maker Zoomit Corp., marking PGP's first major foray into the corporate network world.

Financial terms weren't disclosed by the two privately held companies.

San Mateo, Calif.-based PGP was founded a year ago by electronic-privacy advocate Phil Zimmermann, who is well known in the Internet community for giving away his electronic-mail encryption software in 1991.

The company recently hired an experienced management team, and "everyone was kind of waiting to see what their next product would be," said Ted Julian, Internet research manager at International Data Corp. in Framingham, Mass.

> PGP will find stiff competition in the network security space from heavy hitters such as Novell, Netscape and Microsoft.

Combining corporate user data and passwords into one metadirectory makes information easier to manage and probably more secure, according to Julian. And it might make sense to add encryption files such as digital certificates and public keys to such a directory, he added.

One obvious target is corporate extranets, according to PGP officials.

But PGP will find stiff competition in the network security space from heavy hitters such as Novell, Inc., Netscape Communications Corp. and Microsoft Corp., Julian said.

PGP has a possible strategic wedge in its plans later this year to release a key server that will let companies issue, store, and revoke public encryption keys for hundreds of thousands of users. It will integrate into a company's existing metadirectory. □

Amazon.com to go public

Online bookseller Amazon.com, Inc. last week filed an initial public offering that put the company's value at roughly $300 million.

Founded in 1994, the Seattle company uses online connections to major book distributors to offer 2.5 million book titles. It plans to raise about $37 million by selling up to 2.9 million shares at up to $13 per share.

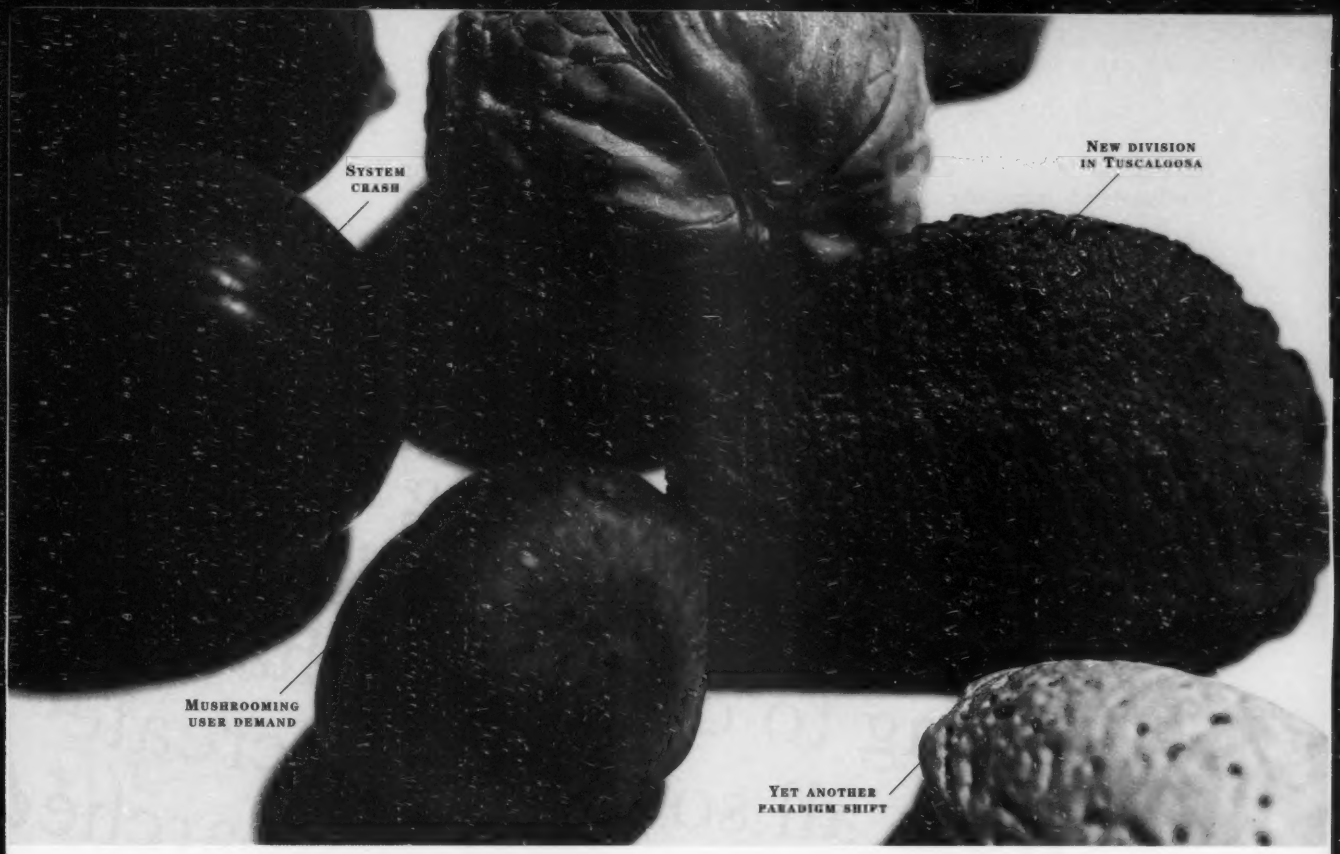
The company's sales last year were $15.7 million, compared with $511,000 in 1995, after it opened for business in July of that year. But because of technology investments and marketing, the company is not yet profitable — it lost $5.8 million last year and $303,000 in 1995. Losses will continue into the foreseeable future, company officials said.

Amazon.com was receiving 50,000 daily customer visits in December, up from 2,200 a year earlier.

Competition for Amazon.com is heating up. The Simon & Schuster unit of Viacom, Inc. opened an online bookselling site this month, Borders Group, Inc. plans a site, and Barnes & Noble, Inc. opened an online bookstore on America Online.

The buzz at the Esther Dyson PC Forum last week was mixed. While many industry players lauded Amazon.com as the "perfect" online business, some thought the company waited too long to go public and will be hurt by the entry of Borders and Barnes & Noble bookstores into the online market.

— Mitch Wagner



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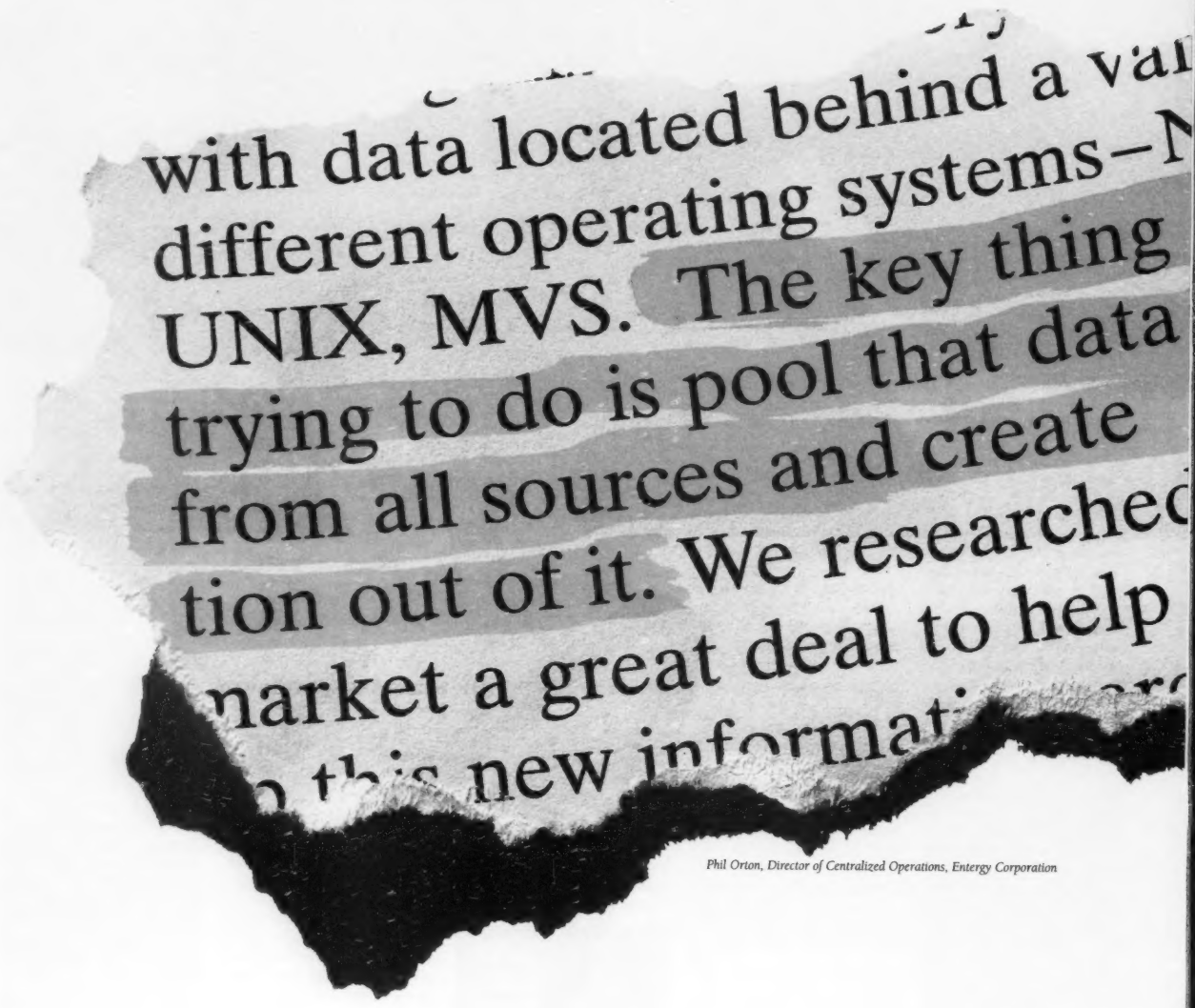
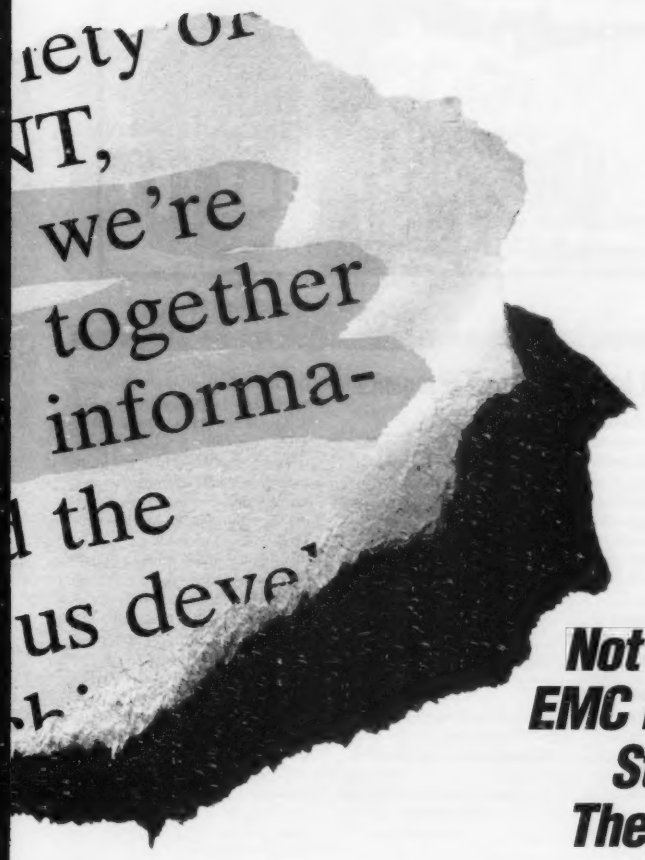


Phil Orton, Director of Centralized Operations, Entergy Corporation



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OPINION

Sunset time. One of the few truly useful concepts in government

is the "sunset law." This tidy piece of legislation provides a dignified death for single-purpose commissions and special task forces once their work is done. It's a shame the computer industry doesn't have one.

A sunset law would sure come in handy for the Software Publishers Association (SPA), the well-heeled software piracy fighters featured in our front-page story ["Software cops under the gun"] last week.

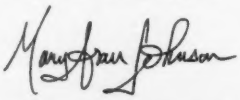
With no legal authority beyond the threat of lawsuits and bad publicity, the SPA can turn up on the doorstep of any IS organization and say, "Show me the licenses." Granted, this was once a very useful function. The SPA helped cut U.S. piracy rates by half since the mid-1980s and sharply raised the awareness of Fortune 1,000 companies about the issue of unlicensed software.

But now what? The group is hard-pressed these days to find any sizable companies to fine or pester with lawsuits. Bummer. So the software cops ventured into cyberspace to shove around a few Internet service providers. The SPA last fall tried to force some providers to sign a "Code of Conduct," which would make them responsible for bad behavior — such as copyright infringement — by their members. Drop dead, the providers said, and the lawsuits quietly fizzled.

Even if you believe the $13 billion figure for pirated software worldwide, it's hard to argue that the industry is staggering from its weight. The packaged software segment grew 12% globally in 1996 to $105 billion.

Users would love to see the SPA do something useful with its time and $9 million budget, such as issue guidelines to help them decipher complex software licensing plans. "Not our job," says SPA Director Ken Wasch, whose $300,000-plus salary is more than twice the average of similar-size nonprofits. Yet the well-paid Mr. Wasch can't even balance his own budget. The SPA lost nearly half a million dollars in the past two years.

It's high time the sun set on this bunch. Say goodnight, Ken.



Maryfran Johnson, *executive editor*
Internet: *maryfran_johnson@cw.com*

LETTERS

There's good stuff beneath Gartner arrogance

YOUR STORY ["The Gartner gods," March 3] is so square on the nail, you could probably drive the nail home with one blow. We retain Gartner Group and Meta Group for technology watch. We have used both for heavy input into our IT functions. They have more than paid for their services in the savings we have reaped.

We have found that Gartner is better at publishing information, and Meta is better at one-on-one work. About 95% of the time, they agree in strategy and content. The other 5% of the time, they are sometimes diametrically opposed, but we use that to our advantage. When they disagree, we usually take a wait-and-see approach until there is some consensus.

When we phone Gartner, they are usually about as arrogant as you can imagine. It is not uncommon for their tone to be condescending. But when you finally pierce their "cloud," the info is good stuff.

On the other hand, Meta has always been more accommodating for one-on-one discussions, treating you like a person, even if your question was ignorant.

> It is not uncommon for [Gartner's] tone to be condescending.

I was not aware of how the analysts are hired. From what you state in your articles, it's no wonder these guys are arrogant and downright bullish.

We have sat in on meetings where these types of groups formulate their weekly bulletins. They are point/counterpoint, slash and run, you name it. The result is a document that goes to the public

with something useful about the item of discussion.

Thanks for a very good article.

Bob Collins
Santee Cooper/South Carolina Public Service Authority
Moncks Corner, S.C.

I WANTED TO let you know that I thoroughly enjoyed your article on Gartner Group. It was insightful and entertaining. It sounds like they haze prospective recruits, no? I read it while reflecting, in good humor, about the positive and negative struggles that software companies must have gone through over the years trying to get the thumbs-up from Gartner.

Bill Perkins
Boston Communications
Boston

Mac OS knows its dates

RUSSELL HOLSCLAW's letter in your March 3 issue ["Macs may face 2000 issues"] represents a misunderstanding about the Mac OS and the developers who write for it. His letter asserts that the ability of the Mac OS to handle a date range well into the next century is no guarantee that programmers have taken advantage of this. There is one simple answer to clarify this: the Macintosh Interface Toolbox, a set of some 5,000 routines that a programmer can rely on to avoid having to reinvent the wheel. The routines handle everything from drawing standard interface components to internationalization and date manipulation.

While it is indeed possible for Macintosh programmers to write their own routines for working with dates, I don't know of a single instance where this is the case.

In the Windows world, cross-platform shops such as ours have experienced a costly transition from a 16-bit architecture to a 32-bit one, but the Mac OS has always specified 32-bit addressing since 1984, and programs written to that specification still run on System 7.6 today.

Richard Gaskin
Fourth World Software
Los Angeles
ambassador@fourthworld.com

More letters, page 42

Computerworld welcomes comments from its readers. Letters shouldn't exceed 200 words and should be addressed to Maryfran Johnson, Executive Editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

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(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep
App. Dev.Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No
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Forget 'push.' Try a nudge instead

Michael Cohn

On any given day, you're likely to be assaulted with many unpleasant verbs. Unfortunately, you're about to get hit with another one: push. Already I'm sick of "push" technology. It's too pushy.

I heard it's a trendy new way of broadcasting to your PC what you want, when you want it. It sounds almost like Internet room service. So we got the boys back at the office to try it. Let me tell you, it was like drinking out of a fire hose. We got too much. We couldn't edit. We couldn't screen. Push? It was more like stampede.

Anyone can push information. But it takes "shove" technology to make you read it.

Maybe push technology will mature. It might even be the next panacea.

But before you plunge in to the technology, realize that you have alternatives. You might want to consider the following options:

PINCH

Almost as good as push, but at one-tenth the cost. It doesn't connect to the Internet. It doesn't even come close to the World Wide Web. You just wait for Ms. McGillicuddy in the accounting department to finish reading the morning paper. Then she E-mails you a quick summary and some nice recipes for quiche.

SHOVE

Anybody can push information; shove makes you read it. Each item arrives with a bothersome buzz or beep that rises to a few hundred decibels if the message isn't opened by lunchtime. This is especially effective when the boss wants to make sure you've seen his critical memos about the next status meeting or the $1 peanut bars he's selling for his kid's marching band.

NUDGE

Push technology for beginners. Some people don't want to be miserable like the rest of us, bombarded all day by electronic information. They'd rather do their job and go home at 5 p.m. You have to reel in these unenlightened heathens with broadcasts they can't resist, such as the cafeteria deli special; highlights from www.melroseplacetv.com; or the salaries of a few folks from surrounding cubicles.

PLOD

Push technology accessed with a 386-based PC and a 2,400 bit/sec. modem.

PRY

Push media that's been censored. Managers: Do you want your ignorant employees reading raw Internet data? Stuff that's loaded with politics, pornography and insurrection? No, all this up-to-the-minute information must wait while some executive decides whether it should be pushed at all. Of course, by then it will likely turn into up-to-the-decade information.

THRUST

For people who don't have time for a few dozen messages every day. Instead, they schedule one session a month, get hit with several thousand critical news items and process them in one grueling sitting. Actually, no one's dumb enough to sign up for this punishment, but it makes the perfect surprise gift for the colleague who just got your promotion — especially late on a Friday afternoon.

PULL

To heck with push. By now, I'm used to pull. That means two hours of wading through waves of undecipherable information and encountering constant confusion and frustration while trying to find a way to get what I want. After all, I've been subjected to this every year for as long as I can remember — it's called a performance appraisal. □

Cohn is a computer consultant in Atlanta. His PC isn't ready for "push," but he doesn't mind kicking it once in awhile.

How big is the gorilla on your desk?

John Gantz

If you have an 800-pound gorilla sitting on your desk, you simply feel different about it than your CEO does. He knows he has one in the building, but he doesn't have to face it. Yours is the more personal relationship.

It's the same way with the millennium bug, according to a survey of 500 U.S. corporate executives by International Data Corp. (IDC). Half the chief information officers polled said the year 2000 date-change problem is a major business issue, but only a third of the CEOs said the same thing.

Some companies face bigger gorillas than others do. Insurance and finance companies are more concerned about the millennium bug than utilities and manufacturing companies, where applications are less date-critical. On average, 55% of CIOs worry that the financial health of their businesses will be harmed if the gorilla isn't tamed. But in the insurance industry, the CIO anxiety index rises to 78%.

Another key finding: The sky isn't falling. Contrary to a widespread forecast by Gartner Group that the global cost to fix the date-change problem is $600 billion, IDC's global surveys and spending model put the price tag at about a third of that.

But that's the big picture. What about your company? Are you ahead of the curve or behind it? It's time for some benchmarking to see where you stand compared with your competitors and trading partners.

The IDC survey revealed the following trends in the way corporate America is wrestling the year 2000 gorilla:

- Many of your peers (40%) started year 2000 projects last year; 23% started them in 1995. About one in five companies waited until this year to begin work on the problem and, ahem, 6% haven't started yet. Communications companies are taking an especially casual approach toward the impending millennium — 16% haven't started work yet.
- About 10% of the companies said their conversion is already complete. They are probably feeling a bit smug at this point.
- Almost half of the companies expect to finish their projects in 1998. Another 15% expect to finish in 1999, which is cutting it close. Experts say 1999 is the year to test the refurbished systems.
- Only 3% of the surveyed companies expect their projects to slip past the Jan. 1, 2000 deadline. IDC predicted there will be even more schedule slips; up to 10% of the companies won't hit the deadline.

Don't let your year 2000 project fall behind the competition.

Let's hope they aren't your trading partners.

- The two most popular fixes are application "renovation" and purchasing new software. But CIOs said it's very difficult to get information about their software vendors' year 2000-compliance efforts. So don't count on your software vendors to bail you out.

Overall, the survey found that the No. 1 problem faced by CIOs is finding the right people to work on the project. If you're starting late, this will be a huge problem. CIOs are diverting resources from other technology initiatives but still may not have enough skilled heads to go around. Nor can you necessarily count on third-party firms; IDC predicted they'll face their own capacity problems. Crack programmers with project-management talent are scarce in both communities.

So, how are you doing? The sky may not be falling, but there is debris in the air. Check to make sure your company isn't further behind than your top two competitors. □

Gantz is a senior vice president at International Data Corp. in Framingham, Mass. His Internet address is jgantz@idcresearch.com

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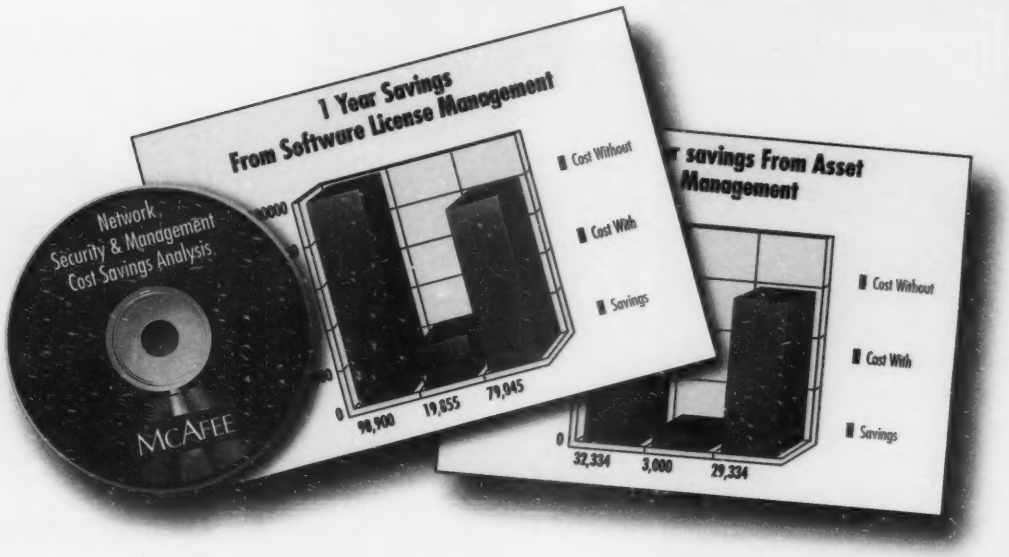

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Desktop Management	X	NO	X
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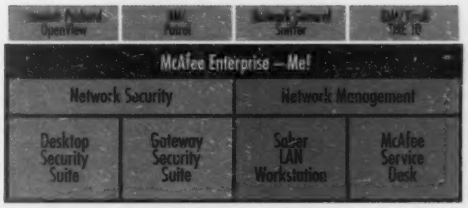

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For sponsorship information contact:
Elaine R. Offenbach
Vice President
Computerworld
Custom Publications
Phone: (415) 347-0555
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May 5	Supplement: Electronic Software Distribution Distribution at Networld + Interop	Mar. 21	Apr. 11
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Jun. 2	Solutions Series: Year 2000: Products (part 2 of 2) Distribution at PC Expo	Apr. 18	May 9

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March 31, 1997

THE YEAR 2000

SOLUTIONS SERIES

The crisis looms large

Don't let your organization go under

Overview by
AberdeenGroup

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A Special Advertising Supplement

DENIAL: It's not a solution, it's a gamble

Introduction

When the ghosts of the past come back to haunt us, it's a scary situation.

In order to save memory — once one of the most precious components of a computer system — programmers in the 1960s and 1970s represented the year in dates using two digits in code rather than four. This practice persisted into the 1980s and even the 1990s as firms tried to maintain backward compatibility with legacy systems — a practice that left many two-digit date fields intact.

As a result, the year 2000 will appear to many systems as 00, not 2000, and will be interpreted as 1900. And lately it seems as if an entire industry has arisen to gauge the implications of this misinterpretation.

Trade-offs from the '60s lead to strategic decisions today

The push by those early programmers for memory economy has today's executives facing critical, strategic infrastructure decisions.

Because the implications of wrong dates on a universal scale are not yet truly known, enterprise IS management and supplier management cannot even fully describe the extent of the problem to their peers, much less provide comprehensive solutions. Information systems today are so widely integrated that finding every likely corrupt transaction resulting from bad-date calculations is an immense challenge. Not finding and correcting bad date fields will disrupt business. And in some cases, those disruptions will be severe.

Some analysts look at the Year 2000 problem and say the sky is falling. Others say the problem will be less cataclysmic than originally thought. Either way, the Aberdeen Group views the Year 2000 problem as much about competitive advantage as it is about technology. In fact, even executives whose roles have nothing to do with technology will find themselves playing pivotal roles in finding Year 2000 solutions for their enterprises.

The key is to start searching for those solutions right away. Many organizations are waiting for a "magic pill" technology to miraculously solve the Year 2000 date problem. This approach is at best a crapshoot, with potentially disastrous implications.

ILLUSTRATIONS BY TIM BRINTON

This is Part 1 of a 2-part Solutions Series on the Year 2000. Look for Part 2, which will discuss specific solutions, in the June 2nd issue of Computerworld.

The lead article in this Solutions Series was co-written by Peter S. Kastner and Susan L. Irving of Aberdeen Group Inc., a market research and consulting firm in Boston. As Group Vice President of Aberdeen, and general manager of its commercial systems practice, Peter Kastner analyzes trends in databases, OLTP, decision support, client/server architectures and distributed commercial systems development. He also conducts studies in distributed systems planning, electronic commerce and database management software issues for suppliers and user organizations. Susan Irving is senior analyst for Professional Services Research. By focusing on the economics of the business from the end-user's perspective, she assists senior executives in analyzing the benefits of using professional services to achieve their enterprise objectives.

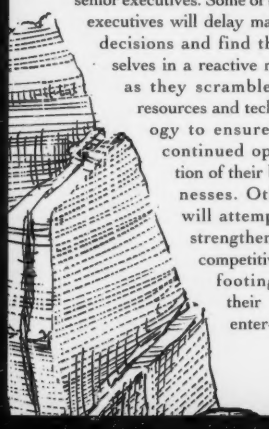
How Enterprise Executives Can Play a Pivotal Role in the Year 2000 Solution

By Peter Kastner
and Susan Irving
Aberdeen Group

Companies that are not Year 2000 safe will see their competitive strengths eroded.

Year 2000 problem will rock businesses with the same force as any sudden, unplanned for market change. Look at how the competitive landscape of the airline industry has shifted abruptly several times in the past 20 years due to regulatory changes, the use of computerized reservation systems and scheduling schemes, and international alliances. The catalyst for each shift differed but the outcome was the same: a reshuffling of industry players. Inevitably, the winners were the companies who found opportunity — not peril — in change.

In the same way, the Year 2000 problem will bring market disruption — perhaps upheaval — to technology-enabled enterprises and industries. The task of hammering out the competitive strategy and plan for survival will fall on the shoulders of senior executives. Some of these executives will delay making decisions and find themselves in a reactive mode as they scramble for resources and technology to ensure the continued operation of their businesses. Others will attempt to strengthen the competitive footing of their enterprises by ensuring Year 2000 safety. For this latter group, the problem will be the catalyst for change that will in turn create opportunity.



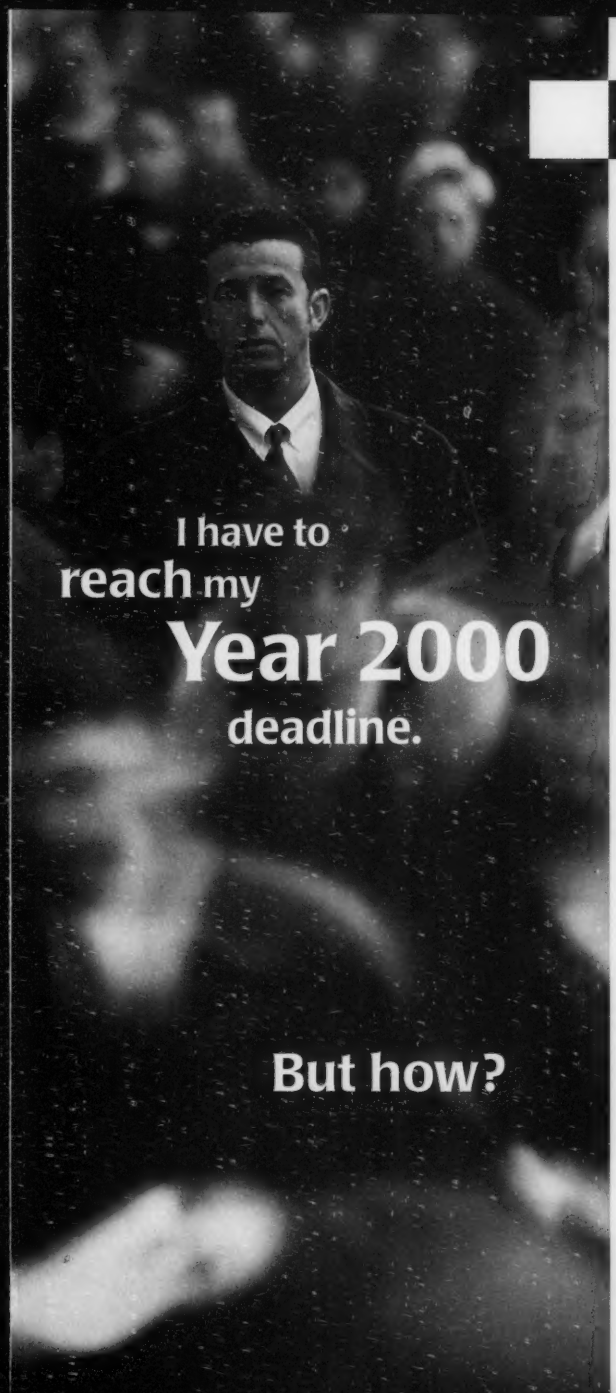
Not just about software

The Year 2000 problem is not necessarily about software. For a company making consumer packaged goods, the problem is about the gain — or loss — of shelf space. (No superstore chain will let a vendor near its stores without proof of Year 2000 readiness for any integrated inventory and provisioning systems.) A process company may find that its Year 2000 problems are about its ability to efficiently and competitively use its asset base. A services company may find that Year 2000 bugs undermine its ability to mine data marts for targeted-customer marketing.

For all businesses, the unifying theme is this: In the best case, the Year 2000 problem is about determining competitive advantage; in the worst case, corporate viability.

Why competitive advantage? Tightly integrated, Web-enabled technology infrastructures are becoming the circulatory system of companies. Global organizations are interdependent on realtime, online worldwide information that can be transmitted from Singapore to Atlanta with a single keystroke.

In many cases, these enterprises are also technologically intertwined with the operations of their customers, suppliers and distributors. If this information flow is compromised, so is their business. And if there is one thing the Year 2000 bug promises, it is to compromise critical information flows within and between enterprises.



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The same interdependence can be found in small and mid-sized companies who use technology to secure relationships with larger companies, to market an amplified presence to targeted customers or to perform vital customer-service functions. No company will be unaffected — the difference will be the degree to which a particular company's operations are altered.

To minimize the risk of your business being compromised, you must start your Year 2000 transition now. Not being Year 2000 safe by the start of the millennium will erode the competitive strengths of companies who, in turn, will lose to industry players who better manage this transition.

Executives in the spotlight

Executives can play pivotal roles in ensuring Year 2000 safety for their enterprises. But to do so, they will need to do three things:

- Require that a comprehensive and proactive plan is in place;
- Secure trusted external assistance;
- Insist that day-to-day business operations experience minimal disruption.

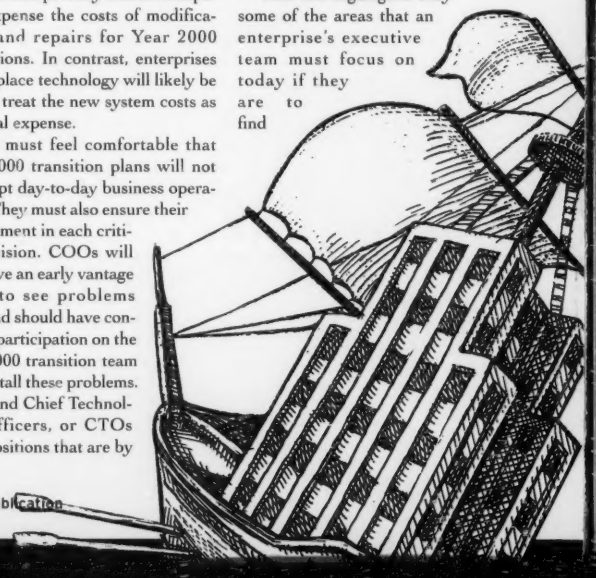
Above all, executives must marshal the collective Year 2000 efforts with a sense of real urgency. This urgency will send a signal to the rest of the organization that becoming Year 2000 safe is a corporate priority, and that meeting the millennium deadline is non-negotiable.

Because Year 2000 is a strategic business problem, rather than a technology problem, each member of a senior executive team needs to identify critical issues resulting from the Year 2000 bug in their area of responsibility and ensure that their 1997 plans address these issues thoroughly.

- CFOs need to be confident that they have all the information to make informed funding decisions for the next five years. They also need to know the potential impact on financial statements and, if their company is publicly held, be prepared with a communication strategy to shareholders and the market at large for 1997 reporting.
- Controllers must check with their audit firm for critical input on how regulatory accounting rulings — for example, the Financial Accounting Standards Board (FASB) in the U.S. — will allow companies to treat these extraordinary costs. FASB is likely to insist that publicly funded companies expense the costs of modifications and repairs for Year 2000 corrections. In contrast, enterprises that replace technology will likely be able to treat the new system costs as a capital expense.
- COOs must feel comfortable that Year 2000 transition plans will not interrupt day-to-day business operations. They must also ensure their involvement in each critical decision. COOs will also have an early vantage point to see problems arise and should have continued participation on the Year 2000 transition team to forestall these problems.
- CIOs and Chief Technology Officers, or CTOs (two positions that are by nature aware of this problem), must have a persuasive business case for Year 2000 funding outside an IT budget. If this is not possible, they must be prepared to offer results-based business cases for saving one mission-critical IT initiative while shelving another to free up resources for the Year 2000 transition. Prepare for trade-offs.
- The Board of Directors must have input if the funds to complete this project will have an adverse affect on three to five years of financial projections. They may also have a fiduciary responsibility to ensure that their company is Year 2000 ready for business. The lawyers are certain to sort this one out.
- Most important, the corporate leader — the president and/or CEO — will play a lead role in ensuring that this is not only an organizational priority, but that the enterprise pulls together in a war-time-like effort to meet the non-negotiable deadline of Jan. 1, 2000. This will involve early coordination with human resources, change management and training.

CIOs must have a persuasive business case for Year 2000 funding outside an IT budget.

This list highlights only some of the areas that an enterprise's executive team must focus on today if they are to find



Year 2000 Best Practice Recommendations

This list of executive best practices, culled by Aberdeen Group from Year 2000 transition efforts, service providers and top Web sites, will grow – and change in emphasis – as we near Year 2000 transition triggers.

1. Start immediately! The Year 2000 problem is large, complex and, as yet, undefined. The only given is that it will get bigger for enterprises that take a wait-and-see approach. The cost of external support will skyrocket as resources are claimed and quality will suffer as companies rush towards a solution. An early start will give enterprises time to deploy solutions strategically, rather than reactively.

2. Stop wounding Year 2000 messengers. Word in the IT cubicles is that there are lots of wounded Year 2000 messengers. Don't be surprised if information about the real magnitude of resource requirements for this project has not yet reached executives in your company.

3. Send lawyers, guns and money. (Substitute "accountants" for "guns" and your company has the start of the resources required for a Year 2000 effort). Issues need to be understood throughout the organization. Accountants can provide details on current regulatory thinking on how to treat project costs — answers that may impact an (expensed) repair vs. a (capitalized) replace decision. Lawyers will educate themselves on an enterprise's potential exposure from the transfer of corrupt data or the inability to deliver product due to a technology error.

4. Request funding for the whole project upfront. Using best estimates and all the trusted external assistance they can secure, CIOs should develop five-year project estimates (assuming two years of post-2000 conversion work) for unique Year 2000 transition requirements. This will be a thankless task as you present this to the board. But laying out the magnitude of the task ahead will allow other critical enterprise resource decisions and planning to be accomplished. Estimating total costs will also strengthen your case for management, rather than IT, funding later on.

5. Treat this as a war-time effort. Fostering a sense of urgency and common purpose throughout your organization will lead to a more focused and comprehensive effort to meet the non-negotiable deadline. This is not just an IT conversion; it is a matter of competitive viability.

6. Secure trusted outside resources quickly. Many vendors are vying for your Year 2000 transition business. In 12 months, this will be a seller's market. When assessing vendors, ask them what they will not be able to do for your business. The best service providers will tell you this.

7. Check hardware, systems software and networking compliance. Conventional fixes treat Year 2000 problems only in applications. There are date-field problems in networking and hardware equipment and systems software that often times are not inventoried — and, ultimately, not fixed. Executives need to feel comfortable that their project team is addressing technologies outside of applications. Executives should insist on vendor documentation and certification of the Year 2000-readiness of their equipment. This compliance documentation should also be secured for all purchased applications.

8. Insist on seeing external partner compliance plans, updates and completion milestones. And be prepared to make your own plans available to partners. Ironically, the enterprises that are the most advanced in linking their operations to the operations of their vendors, customers and distributors are most at risk for corrupt data. Executives need to ensure that all external links are Year 2000 safe — and that they can provide this safety back.

9. Put the community of Year 2000 resources to work. Encourage the project team to use (if they don't already) the Internet communities that have sprung up to tackle the problem. In addition, regional user groups offer a lot of valuable shared experiential advice.

10. Beware the Law of Unintended Consequences. Getting to Year 2000 compliance will likely require new software versions of compilers, operating systems, utilities and other infrastructure software. Expect problems induced from the infrastructure changes before you even change one line of Year 2000 source code. Also, plan for performance tuning as part of the test cycle.

11. Staff a post-2000 SWAT team. There will be lots of work to do after 1/1/2000. Even the best efforts may not trap and fix all dates. And some disruptions from bad dates will not be discovered for months. There will also be unanticipated sources of external data that could corrupt your information. A team should be rested, ready and eager to tackle whatever comes up as the century changes.

12. Save the blame for January 1, 2000. Many companies are currently engaged in time-wasting discussions aimed at affixing blame for the problem. Companies should not blame anyone — yet. Casting blame today diverts attention away from the real need to fix the date problem quickly, effectively and comprehensively. On Jan. 1, 2000, the finger will most likely be pointing at vintage 1997 decision-makers who refused to acknowledge this problem and who did not allocate the proper resources and time early enough to fix the problem.

13. Don't use misfits and re-treads. Give the troops fighting the Year 2000 war a rosy picture of their post-war career path.

Year 2000 Issues: Understanding Will Lead to Action

By John R. Logan, President, Aberdeen Group, Inc.

Perhaps one of the most startling aspects about the Year 2000 problem is how few enterprises have a comprehensive, realistic plan to deal with it. Yes, technical repair plans are in place — but few IS professionals believe that these can be accomplished in time, within budget and without disrupting business operations.

Even those enterprises that are well on the way to fixing their legacy applications are pulling staff off high-priority application development and implementation projects, because the assessment phase of their Year 2000 repair efforts has started to uncover more problem areas than originally anticipated.

As these new technical problems surface, even the most competent senior enterprise executives are not prepared to proactively manage the Year 2000 repair process. No organization confronting a crisis can long afford to tolerate this type of situation.

Executives, both in IS and at senior operations levels, still do not feel they thoroughly understand the issues involved in managing through the Year 2000 problem.

Even more unsettling is the fact that, as their knowledge increases, all they see are higher expenses that are not covered by today's budgets. In the private sector, this formula often translates into lower profits; in the public sector, it translates into budget overruns that must be explained to skeptical oversight boards.

Look at the long term

To manage through the Year 2000 transition, you must realize that it is a long-term extended enterprise information infrastructure and operations business issue. Once the true scope of the problem is understood, there are four actions that should be part of every plan:

- Where possible, replace all technology components that cannot effectively support Year 2000 safe date codes. (Replacement may appear more costly than repair — until risk factors, lost opportunity costs and financial considerations are taken into account.) Appoint a Year 2000 task force to make implementation decisions right away. (And yes, this will be a high-stress position. The impact of many Year 2000-related decisions are difficult, if not impossible, to quantify.)

- For non-compliant applications and components that must be repaired because they cannot be replaced, determine the lowest level of functionality your enterprise must have from them. Put these "good-enough" repaired applications in place as quickly as possible (but by November 1998 at the latest) to be able to take the additional corrective actions required to keep your business operative.

- Plan to test, re-test and re-test again until your entire information infrastructure is proven safe. Be sure to test date-format interfaces with business partners and government agencies with whom you electronically exchange data.

- Work only with hardware, software and professional service suppliers who have a long-term commitment to your success. Managing through Year 2000 issues — technical, business and legal — will be a tough battle. You will need allies and trusted advisors upon whom you can depend.

Every Year 2000 management action plan must project the timing and costs required to establish the desired levels of functionality and quality for your enterprise's information infrastructure today and through the millennium transition. Quite a challenge — and one for which you will need to employ your very best management skills.

Time to call HP.

ONLY 1,006 DAYS LEFT For the information technology executives who hear nothing but doom and gloom about the coming of the year 2000, we offer a brighter picture: one that includes an opportunity to re-think, perhaps re-engineer, and most definitely provide your enterprise with more flexibility and power than ever before. Since you need to fix the Year 2000 problem anyway, we suggest you do it using the latest Internet-enabled, client-server technology that prepares for the future instead of echoing the past. With our world-class partners, we can help provide everything you need, from decision support and data warehousing applications to mission critical environments. The bottom line: if you haven't contacted us already, it's time to do it now. Capitalize on chaos. Call 1-800-HP-KNOWS.

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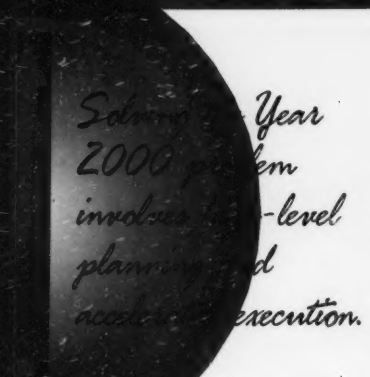

Year 2000 solutions. Many others exist. For instance, who will be responsible for ensuring that any technologically linked vendors, customers, suppliers or distributors are also Year 2000 safe and will not be able to corrupt the information in your systems? And as Year 2000 problems become operationally apparent and business-changing decisions need to be made, who will be responsible for corporate-wide employee communications?

This list also does not account for the equally critical work of the project team, including finding and using tools to correct bad dates, developing and verifying lists of Year 2000-compliant hardware, software and networking vendors (both for existing systems and replacement options), and managing staff morale on a project where the nature of the work is often monotonous and career-limiting.

Obtain outside help

Most companies, lacking the resources, time or comprehensive knowledge to address the breadth of Year 2000 problems, will require external assistance for their Year 2000 transitions. Yet there are no one-stop shopping options for such solutions; today's providers are focusing on application conversion issues, while overlooking hardware, networking and business issues.

Because there are so many pieces to the Year 2000 puzzle, executives should engage a trusted professional services provider to help them navigate the business and technology decisions.

One attractive option is the consulting arm of your audit partner — or a firm referred to you by them. This firm has a stake in the ongoing viability of your business, understands the inner workings of your operations, and is positioned to continue to apply the best practice learning from its collective Year 2000 projects. Although this firm will not provide one-stop shopping services, it will be in a position to understand where to secure additional resources.

If your audit firm's consulting practice is unavailable, there are many other top-notch consulting and conversion firms who can provide support. A list of such vendors can be found at the Web site www.year2000.com. Insist on references from consulting companies with applicable experiences to ensure that you have not merely found an opportunist in a three-year market.

Whomever you choose for external assistance, you need to secure that relationship ASAP. By mid-1997, there will be little capacity left in the industry. This will drive conversion prices up and quality down, and will jeopardize the chances of many companies for a safe Year 2000 transition.

Conclusion

Aberdeen Group believes that there will be enterprises who gain from their Year 2000 solutions by ensuring that their technology infrastructures continue to enable, rather than disable, their business objectives through the millennium transition.

And because no company is an island, these internal technology infrastructures often encompass external partners — vendors, customers and distributors — who must also be able to share data that is not corrupt.

Enterprise executives can play a pivotal role in the Year 2000 solution by bringing to the surface critical business issues that result from Year 2000 repair strategies — and developing and executing the proactive plans needed to deal with these issues.

The upshot is that solving the Year 2000 problem involves high-level planning and accelerated execution. The challenge today is for executives to devise a realistic solution for their enterprise (and their enterprise's partners), secure adequate resources to support this effort, find trusted external consultants, vendors and tools before these resources are claimed, and ensure an active forum for the escalation of critical business decisions that must be decided by senior management.

Executives that meet Year 2000 challenges head-on will lead their enterprises through a more graceful transition into the next millennium while gaining competitive ground on rivals who are not Year 2000 ready.

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This Solutions Series on the Year 2000 issue was created by Computerworld Custom Publications. For reprints, contact Heidi Broadley at (508) 820-8536 or at heidi_broadley @ cw.com.

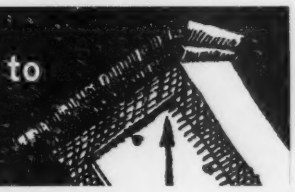
The Aberdeen Group is at (617) 723-7890. Peter Kastner can be contacted by E-mail at kastner @ aberdeen.com.

Questions or comments on the second story in this supplement should be forwarded to managing editor Peter Bochner at (508) 820-8289 or peter_bochner @ cw.com.

Part 2 of this Series will deal with specific solutions to handle the various pieces of the Year 2000 puzzle. It will appear in the June 2nd issue of Computerworld. Editorial inquiries should be addressed to Peter Bochner.

Management: Key to Year 2000 Success

By Anna Tortig



There are penalties galore, particularly for CIOs.

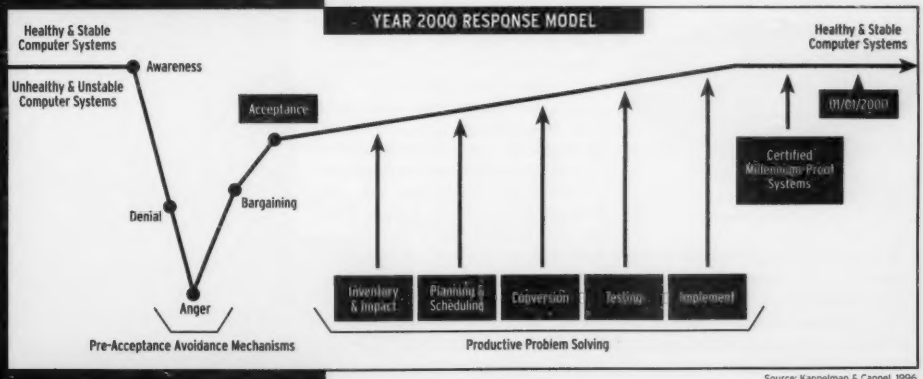
It's a lousy job, but somebody's got to do it . . . managing year 2000 date-change projects, that is.

The Year 2000 problem presents IT professionals with immense project management and organizational challenges. First they have to convince CEOs and other top managers that they should fork over $1 million or more to rectify a problem that was in fact created by data processing departments. Then they have to convince programmers to put the brakes on career advancement and take on the boring, tedious and time-consuming task of checking thousands and thousands of lines of computer code for any potential failures when the clock strikes 12 on Jan. 1, 2000.

There's neither visible return on investment for management nor glory for the troops in the trenches. But there are penalties galore, particularly for CIOs. Thomas D. Oleson, an analyst at International Data Corp. in Framingham, Mass., puts it bluntly: "For CIOs, this is a career-ending project if they screw it up."

And screw-ups could have dire repercussions for an organization when it comes to Year 2000. "This is a stay-in-business situation," says Wayne Johnson, senior project manager at Reliastar Financial Corp., a life insurance and annuities company in Minneapolis that in the next 21 months will pump $39 million into changing 15 million to 20 million lines of code across all its applications. Notes Johnson: "It touches just about any line of code we have."

Because it started early, Reliastar should be safe. But IDC's Oleson estimates that 10% of large corporations will not finish the task of conversion by the year 2000 deadline. Others, he notes, will meet the dead-



Source: Kappelman & Cappel, 1996

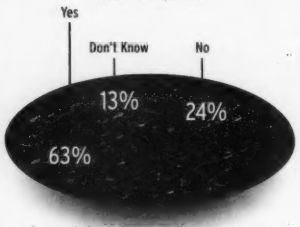
line but will still be finding bugs after the fateful day. (Perhaps long after. Bugs don't always show up right away. In a program Oleson wrote as an insurance actuary in the 1960s, "the bugs didn't show up until the end of the 1970s," he notes, "because we didn't go down that branch of the program.")

Only 16% of those heading up Year 2000 projects are devoting more than 90% of their time.

What will happen to the laggards — the companies that don't make the deadline? Theresa O'Neil, vice president of marketing, data warehousing, for Platinum Technology, offers one scenario. "They'll return to paper forms, because their computers won't process the right information," she says. "Payroll and accounting will get done, but other applications will get put on hold."

Is your company's executive management aware of the real risks involved in this project?

Total: 157 responses



Comment: One in four executive managers are unaware of the real risks of the Y2K project. The question is, who's going to bring them up to speed?

SOURCE: Year 2000 Information Center

Of course, the good news is that most corporate managers — CEOs, COOs and CFOs — are already aware of the problem and understand the consequences of not complying in time. But according to an IDC study, the degree of concern varies by industry. In the insurance field, where dates are in nearly every line of code, 78% of IS managers consider the date-change problem a major concern. In banking, 64% of IS executives feel that way. But in the manufacturing segment, only 41% of IS executives, 20% of CFOs and 10% of CEOs believe that Year 2000 is a major business issue.

CIOs tend to see the problem as a major business issue more often than CEOs or CFOs. (That's understandable, since they're the ones whose careers are on the line.) But there are many other blind spots in the recognition of the problem.

IS leads in awareness

According to a study by the Society for Information Management (SIM), based in Chicago, the perceived level of organizational Year 2000 awareness does not extend much beyond the IS department. The study noted a very low incidence of reported discussions with auditors and legal staff, two groups that should be involved early in attacking the problem. It also said that CIOs and project managers may be reluctant to carry word of the problem outside the IS department because they are uncomfortable about the problem's origins.

The study detected other concerns. One problem pertained to those heading up Year 2000 projects. For instance, 61% of those in charge of Year 2000 projects have had the assignment for six months or less; only 11% have been in the saddle for more than 12 months. Worse, about 35% of organizations polled appeared to have no one in charge of the situation.

Those who were in charge reported that they were spending less than a third of their time on the project. Only 16% were devoting more than 90% of their time. That means most Year 2000 managers are not devoting full-time attention to the project, and, according to the study's author, "if these figures are even half true, they portend of a serious degree of very negative year 2000-related consequences."

The SIM report also suggests that important projects, particularly in the area of application development, may

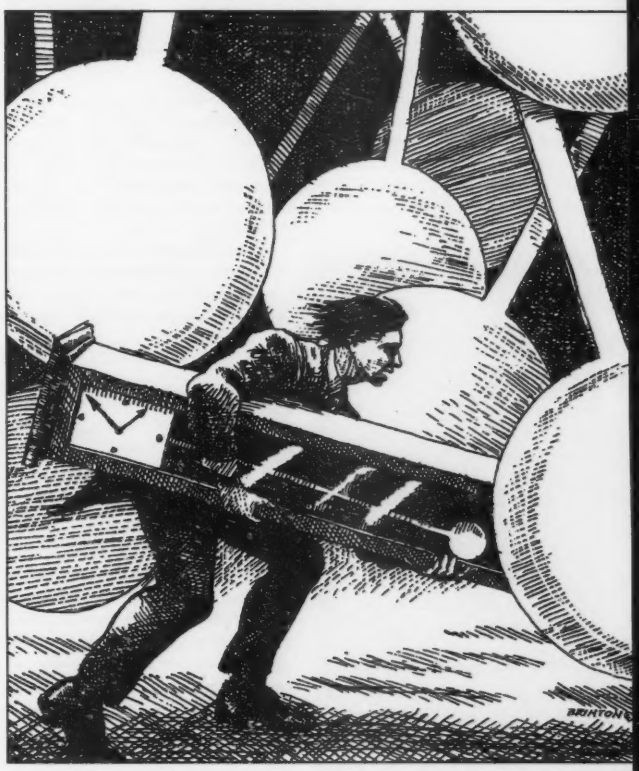
You're in good hands with . . .

Several insurance companies have begun issuing Year 2000 insurance policies to cover business disruptions that may result when systems are converted to handle the date change.

These insurers are expected to be very selective in insuring companies. If a company does not have a comprehensive Year 2000 plan, or if it does have one but does not execute it, it might not be able to collect.

So far users seem less than bowled over by the policy. One attendee at a Year 2000 conference said, "I can just see going up to my boss and saying, 'Our systems don't work. But don't worry, we're covered.'"

But if nothing else, such an insurance policy may be "brilliant in terms of raising management awareness," says Don Estes, a Year 2000 consultant in Lexington, Mass. "Now you can go to the CFO and speak in terms he understands."



be ignored as a result of the focus on Year 2000. The flip side may be true as well. Europe, notes O'Neil of Platinum Technology, "is having a heck of a time getting corporate buy-in on the Year 2000 issue. Their focus is on the issue of European currency."

Leon Kappelman, co-leader of the SIM 2000 Working Group and an associate professor at the University of North Texas, says it is crucial to assess the risks — "If it has anything to do with a chip, it is potentially at risk," — and convey that message to management. He said it may be enough to familiarize CEOs with the ramifications of the matter by setting up a test of a mission-critical system and showing what will happen if the company doesn't change its code. In other cases, outside pressure (for example, from an industry group) may be required. The Securities Industry Association has created a Year 2000 committee to ensure that securities companies, banks, stock exchanges and their business partners are compliant. The group plans to conduct a compliance test of Wall Street companies in early 1999.

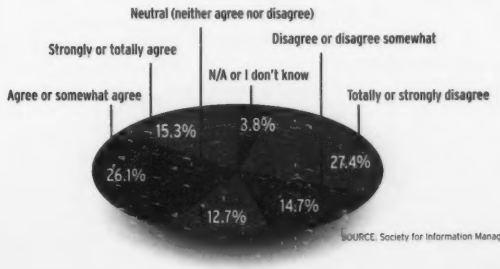
But for CIOs, getting a message across to top management can be tough. CIOs who are currently involved in Year 2000 projects say that when they brought their boss the bad news, the initial reaction was negative. "The reaction by most CEOs is the same: Why did DP do this in the first place?" says Roland Laferriere, CIO of BJ's Wholesale Club, a membership-only warehouse club headquartered in Natick, Mass. Laferriere admits to having felt chagrined when he explained the root of the problem to the president of BJ's. "CEOs understand what happened, but still can't comprehend why," he says.

Dave Iacino, the project manager of BankBoston's millennium management team, reports encountering the same anger and denial when he first went to the Board. But those emotions were quickly replaced by the realization that the problem was real. "Because the CTO had done his spadework people knew how to spell millennium," he says. "Funds were committed almost on the spot."

Pressured CIOs can try to turn this tension-ridden situation to their favor through careful project management, starting with their initial efforts to gain

Solving this has the highest priority in my organization

Responses of 156 CIOs and IS managers



SOURCE: Society for Information Management, 1997

the ear of top management. For them, the best strategy may be to anticipate management's questions and explain the date-change problem in a way they can easily understand: an article from a business publication or by illustrating a good deal of time with top management reviewing the history of the problem, why it takes so much time and effort to correct, and what the repercussions might be.

Cafferelli's plan was to get the CEO on board first, then to talk to the CFO and senior executives of departments. Showing management some articles from business publications convinced them it wasn't just a case of a computer glitch, but something that "affects the bottom line," he says.

Converse has allocated about 30% of its programming staff primarily to its mainframe systems, going through code, identifying fields and testing the programs. They are taking an inventory of all programs and tables and identifying how much of the code needs to be changed. The company also hired three contract Cobol programmers, since programs written in Cobol — the leading language for business applications and programs in banking and insurance — lie at the heart of many millennium problems.

At Converse, all systems that were used regularly needed some changes. "That amounts to thousands of programs, and 75% of our financial systems," says Cafferelli. Some of the individual programs only required a total of 5% of the code to be changed, others 25% or more.

The issue also forced Converse to decide whether to replace its 10-year-old mainframe, which handles order processing, with a client/server system. "We had to resolve this issue before tackling the Year 2000 problem. The choice was to put in a new system or change this system over the next three Year 2000 failure on a key application.

"We did a slow, gradual preparation, told them what it will cost us and how it will affect operations and business plans," says Laferriere. "The more you can prepare and anticipate questions, the better."

At sporting goods maker Converse Inc., in North Reading, Mass., talks on how to handle the issue began a year ago. CIO Vincent Cafferelli spent a

Anything that has anything to do with a chip is potentially at risk.

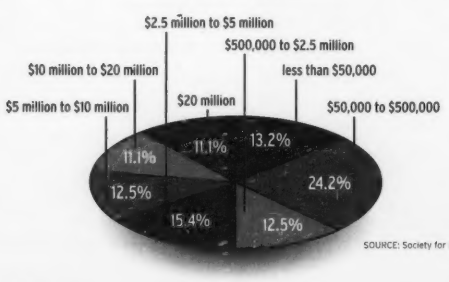
Even the feds see the light

Even the federal government, which is wrestling with some legacy systems so old that replacement parts are no longer available, seems to be emphasizing management skills over technology as the key to Year 2000 compliance. "The enormous challenge . . . is not technical; it is, rather, managerial," said Joel Willemssen, director of the information resources management, accounting and information management division of the Government Accounting Office (GAO), in testimony Feb. 24 before the Subcommittee on Government Management, Information and Technology, in the House of Representatives. (GAO is the congressional investigating agency.)

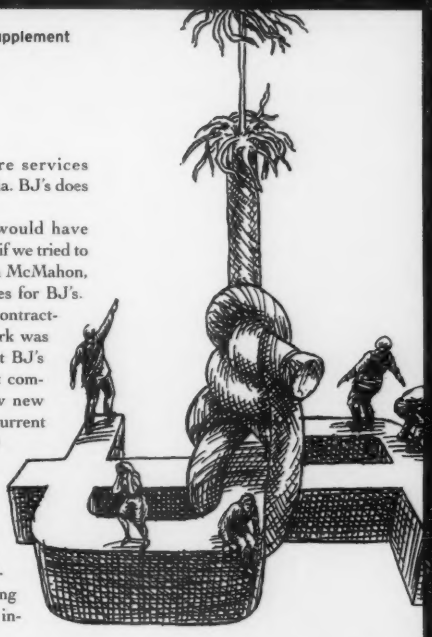
"Whether agencies succeed or fail will be largely influenced by the quality of executive leadership and program management," Willemssen added. "It will be imperative for top agency management — including the agency head and the CIO — to not only be fully aware of the importance of this undertaking, but to communicate this awareness and urgency to all agency personnel in such a way that everyone understands why Year 2000 compliance is so important."

How much do you estimate it will cost to make your organization's information systems Year 2000-compliant?

Responses of 136 CIOs and 15 managers



SOURCE: Society for Information Management



years," Cafferelli says. "We decided to change the mainframe because . . . changing to client/server was too risky." Converse aims to complete its Year 2000 conversion by January 1999, giving it 12 months to work the bugs out. Cost to resolve the issue: $750,000.

For a firm reengineering its business with client/server systems, whose software accommodates four-digit dates, the date-change problem has essentially disappeared. "A lot of our mainframe systems are being moved to client/server, so that aided the Year 2000 part of our reengineering process," says Frank Gladwell, IS manager at Berry Network Inc., a Dayton, Ohio, national marketer of Yellow Pages advertising and a subsidiary of Bell South. Berry and Bell South each have teams working on the date-change problem, which impacts fewer than 5% of Berry's programs, "so we're close to being done," Gladwell says. Berry runs articles in the monthly company newsletter to keep employees up-to-date on its Year 2000 progress.

Killing two birds with one stone

Datapro Information Services Co., a market research firm in Delran, N.J., has already solved its Year 2000 issue with client/server systems, says Martin Levine, director of technology. "With us, it wasn't a Year 2000 issue, but an issue that our business system needed new functions, so we took care of the Year 2000 problem at the same time," he says. "We've reengineered our systems, not only fixing dates but improving the system as well."

The biggest challenge in date conversion is figuring out how one piece of code in one program affects one in another program. Tracking such ripple effects is a seemingly endless task, since testing every branch of every program is impossible, from the standpoints of money and time. To relieve its own programming staff of such tedious work, BJ's decided to outsource mainframe conversion work to ITL-Infosys Technologies Ltd., a software services provider in Bangalore, India. BJ's does the final testing in-house.

"Our business plans would have been significantly impacted if we tried to do this in-house," says Tom McMahon, manager of systems services for BJ's. IS management felt that contracting out the bulk of the work was the best way to ensure that BJ's would both meet its target compliance date and not slow new development efforts. The current schedule calls for BJ's 10 mainframe applications — which contain 6 million lines of source code — to be converted by July. By then, 80% of its systems will be Year 2000-compliant. BJ's is converting other desktop systems and in-store POS systems itself.

Laferriere figures that BJ's is not only ahead of its competitors in date conversion, but it also has reduced conversion expenses 50-60% over standard U.S. prices of $1.10 to $1.50 per line of code. "A critical part of the project was minimizing our staff's exposure to long-term, laborious, boring work that is not career-enhancing," he says.

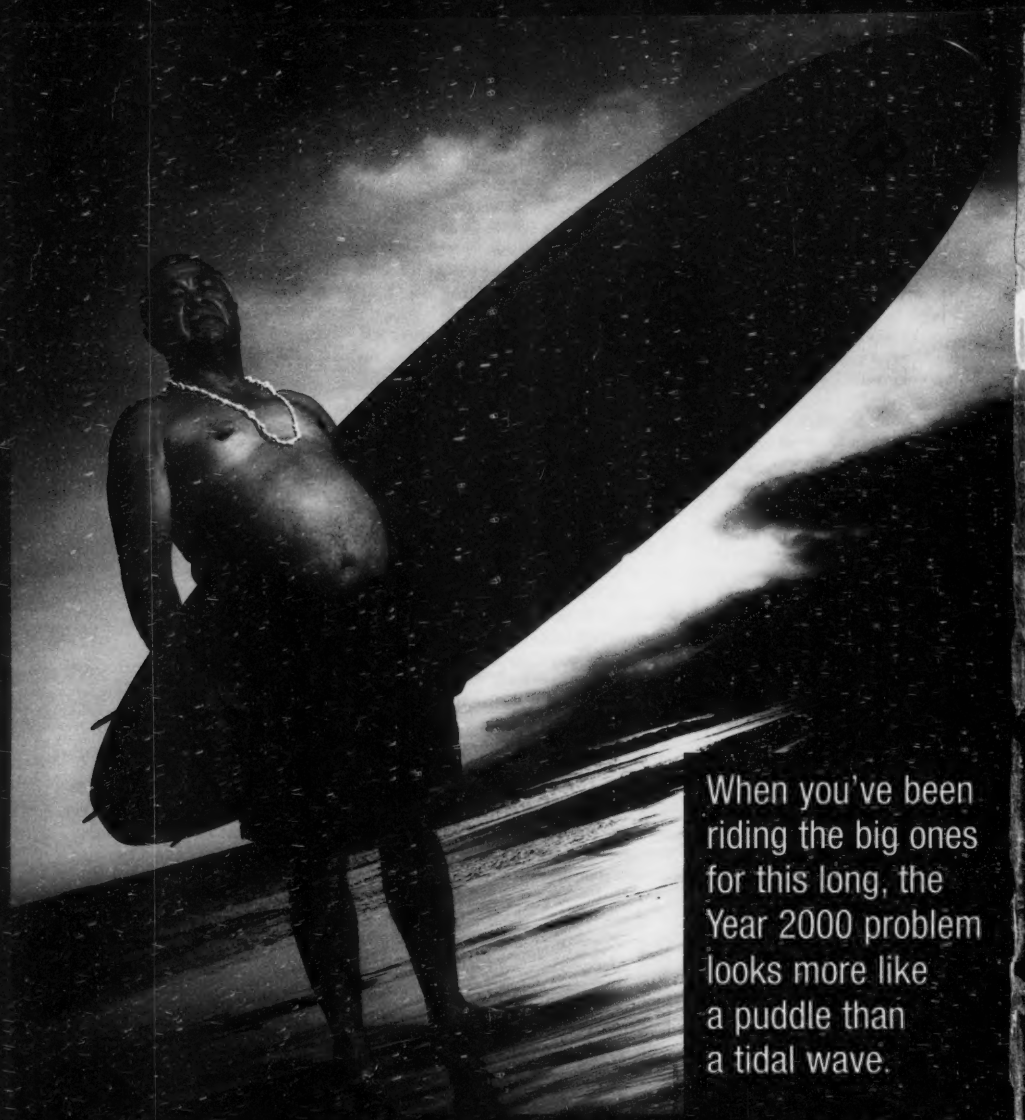
Cafferelli agrees that a Year 2000 solution especially taxes programmers. "Programmers tire easily and get slower as the project progresses. It is extremely tedious work. They must check to see if programs fall through the date field."

United Stationers Supply Co., Inc. of Des Plaines, Ill., is currently deciding whether it needs to outsource part of its Year 2000 work. In February the $2.3 billion distributor of paper supplies completed an analysis showing that less than 5% of its code in affected programs required change. The company is now conducting a pilot project with two tool vendors and an outsourcer. When the project is completed, in the second quarter, "we will develop a plan to see if we can handle this in-house," said project director Bob Niedzwiecki.

How should a CIO who hasn't started Y2K repair efforts go into the CEO's office? With resignation in hand.

Niedzwiecki advises CIOs who haven't begun Year 2000 plans to conduct an impact analysis . . . immediately. BJ's CIO Laferriere puts it more bluntly: "If you haven't already started, go in with your resignation in hand."

Anna Tortig is a freelance writer in Cambridge, Mass., who covers technology and related issues.



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COMMENTARY

The need for wired consumers

DAVID MOSCHELLA

SEVERAL RECENT STUDIES provide compelling evidence that PC sales to U.S. consumers have slowed considerably. International Data Corp. (IDC) estimates that at the end of last year, 37% of U.S. households had a PC. Odyssey Ventures puts the figure at 35%. More tellingly, both companies agree that last year's levels were only slightly higher than they were at the end of 1995. Similarly modest gains are expected this year.

Should you care?

If your company sells directly to consumers, and if you are interested in using the World Wide Web to better reach and service them, the answer is yes. It's hard to dispute the view that the percentage of homes with PCs is the single biggest determinant of future business/consumer online interaction.

For example, if only 10% of consumers used PCs, the potential for business-to-consumer electronic commerce would be virtually nil. On the other hand, if 80% or more of U.S. households were online, radical business transformations would be possible, even likely.

But at a time when society remains stuck in the middle zone, developing effective consumer strategies is considerably more difficult. Clearly, with millions already online, some level of experimentation and service is often required. But as long as most customers do business by more traditional means, the new and the old will have to run in parallel. The risk is that the need to maintain redundant capabilities can result in higher expenses and diminished productivity.

NOT JUST A MATTER OF PRICE

That the consumer market is slowing, even while the economy stays strong, suggests there are problems beyond just the high cost of today's PCs. Certainly, vendors have often misled the public by talking about $1,000 systems. By the time a customer adds a typical printer, monitor and set of software, the price is usually closer to $1,500 — and often much more.

But high prices aren't the main problem, as shown by consumers' relatively low interest in inexpensive used PCs (compared with, for instance, used cars). The lack of simple and compelling applications remains the real limiting factor. There are millions of consumers who could afford to purchase a new or used machine, but have chosen not to.

In this sense, the unflattering and often unmentioned reality is that today's home PC market is just as much divided between "the wants and want-nots" as it is the "haves and have-nots."

The IDC and Odyssey data suggests these divisions will persist. Not surprisingly, vendor interest has gravitated back to the corporate market, where a broad commitment to universal PC access allows for more radical business transformation. Imagine if corporate America had to maintain its old paper-based systems, and you get a sense of today's consumer market dilemma.

But because consumer spending accounts for two-thirds of U.S. gross domestic product, business computing can't reach its full potential without an equally robust consumer sector.

In the end, business-to-business computing is the lesser challenge.

True electronic commerce requires a wired consumer. □

Moschella is senior vice president of research at Computerworld, Inc. His Internet address is david_moschella@cw.com.

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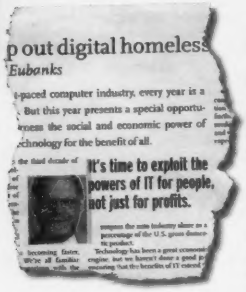
Organizations already providing national sponsorship include Cellular Telecommunications Industry Association Foundation (CTIA), Digital Equipment Corporation, and MCI Foundation.

LETTERS

CONTINUED FROM PAGE 36

What about books? Not everybody needs the Internet


p out digital homeless
Eubanks
-paced computer industry, every year is a
But this year presents a special opportu-
ress the social and economic power of
chnology for the benefit of all.
the third decade of
It's time to exploit the powers of IT for people, not just for profits.
becoming faster, We're all familiar
Technology has been a great economic engine, but we haven't done a good job ensuring that the benefits of IT extend

I BELIEVE IN HELPING those without the resources necessary for success and survival, as do most people. However, I have two problems with Gordon Eubanks' Feb. 24 column, "Stamp out digital homelessness." The first is the arrogance we in the information field seem to have. There are a great many occupations that IT has little to do with, and access to information via the Web is not necessary for success.

My second objection is that we seem to want to continually remove from people an incentive to strive. Eubanks states that 60% of our citizens have never read a book despite easily accessible public libraries and public transportation. We need to teach and encourage use of these resources before technology is of any use.

Kevin Brown
Gainesville, Fla.
brownkj@gru.net

I WISH GORDON EUBANKS would have done something more productive in his week as *Computerworld* editor than give us yet another sermon about the need for universal access to computer technology.

Gordon, read your own editorial! Sixty percent of our citizens never read books, yet public libraries have made access to books universal. Does universal computer access guarantee usage? No.

Worst of all is that while the number of individuals sermonizing about universal access is great, the number of proposals on how to do it are few. Unfortunately, the only feasible way to force universal access would be to involve the federal government. Do you really want the federal government to set up the Office of Internet, Networks and Komputers (OINK), otherwise known as pork for hardware and software companies?

John Fox
Indianapolis, Ind.
johnfox@in.net

Trust UPS? They can't find my door

I AM STILL LAUGHING after reading your article, "UPS insists signature data is safe" [CW, Feb. 17]. I work from my home, where there are two entrances: the blindingly obvious front door at the end of a cement walk and another one, down a rocky dirt side path and over the woodpile.

Despite numerous phone calls to supervisors and chats with their drivers, UPS insists on delivering to a door I rarely use, delaying my receipt of important documents. They can't find my front door but want me to entrust them with a digitized image of my signature? I don't think so!

Jim Domiano
Mequon, Wis.

Stay-on contracts bring stability

I REALLY HAVE TO WONDER if the "IS pros" who found the concept of "stay-on" contracts so "insulting and demeaning" ["Nobody move," by Maryfran Johnson, March 10] have themselves been burned by fellow employees who got their training or certifications and then immediately used them as resume-dressing to land a better job. In smaller IS organizations, as those people go on to greener pastures, they leave behind their former co-workers who must try to help the company down the technology path it has already committed to. Managers are then understandably gun-shy about sending someone else right off to the same expensive classes.

When employees take the training and run, they aren't hurting some faceless corporation — more often than not, they're hurting the very IS team they were once a part of. Sometimes the loyalty you speak so fondly of is best seen in the "untrained" people left behind. Ironic, huh?

Bryan Figler
Cleveland
bfigler@stratos.net

Sales pitch was misleading

I RECENTLY RECEIVED a flyer from Dell Computer advertising a "Networking Technology Seminar" sponsored by Intel, Microsoft and Dell and offering free Microsoft Office 97 software — a $435 value. Great, I thought. So I drove 30 miles from Tacoma, Wash., to Seattle and attended the seminar. When the sales pitch, uh, seminar ended, we were shocked to find the free Office 97 CD-ROM is 60-day "evaluation" software. This may not be false advertising in the strictest sense, but it is misleading. We were left wondering whether sales pitches for the products are also false or misleading.

The five corporate evaluation CD-ROMs we received contained Office 97, Windows 95, Windows NT Workstation, Internet Explorer, FrontPage 97, Team Manager 97 and Project for Windows 95. Imagine a small company installing some or all of this and having it expire in 60 days. This clever scheme may lock a prospective corporate customer in to purchasing and using these products. I suppose that is the idea.

P.S. Dell called last week, apologized and said there was a "miscommunication between the sponsors of the technology seminars." They will be sending us a nonevaluation version of Microsoft Office 97.

Jim Steel
Professional Computer Consultants Co.
Tacoma, Wash.
jsteel@wa.net

Happiness, IS-style

YOUR ARTICLE "IS money can't buy happiness" [CW, Feb. 24] should be required reading for all information systems management and their respective human resources departments. After 13-plus years in IS as a consultant and now as a business analyst for a shampoo factory, here are my rules for keeping your IS staff happy:

1. Push education and training, even if people request training in languages, applications or software you don't have. And don't do it at lunch. Do it on company time.

2. If you expect your people to travel, never quibble over expenses unless they are absurd. Make the reimbursement process as fast and efficient as possible.

3. Never bring in Andersen Consulting for anything. Unless your intention is to rid the department of qualified personnel.

4. Any decisions regarding standards and procedures should be left up to the technical staff. IS must work as a team: management, business analyst and programmer. Good managers are lousy programmers.

5. Never tell the staff that they will be expected to work overtime (late nights or weekends). Ask them. People are more likely to put in the extra hours if they believe it is their choice.

B. McCann
Melrose Park, Ill.

Sit up straight

PERHAPS ALLAN ALTER could explore dropping his title also ["May the CIO title R.I.P.," March 3]? Where CIO is a common industry acronym, Allan's title of Senior Editor, Managing, provides no indication of his specific job functions. Your magazine is ripe with self-indulgent titles for a majority of your staff members who contribute to your informative publication. And one more thing — could you all sit up straight and not tilt your heads when smiling for the camera? You're reporters, not Hollywood celebrities.

Brian Howland
Boston

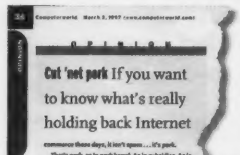
Per-minute Internet usage doesn't solve anything

NEAL WEINBERG'S opinion piece ["Cut 'net pork," March 3] touched on Internet pricing and telephone congestion but looked at only the most superficial possibilities. Flat-rate Internet pricing is a long-term tradition that has led to the tremendous experimentation that makes the Internet so valuable today.

Suggesting per-minute charges is simplistic because actual pressures in the telephone network are a complex mixture of usage-sensitive and usage-insensitive costs.

Many creative researchers are looking for ways to improve service without the yoke of per-minute charges. A new network optimized for data (packet-switching) instead of voice (circuit-switching) will probably emerge and will throw all pricing considerations up in the air. How to fund such a network — now that would make an interesting article.

Andy Oram
O'Reilly & Associates, Inc.
Cambridge, Mass.
andyo@ora.com


Cut 'net pork If you want to know what's really holding back Internet

WHO DIED AND MADE big business the proprietor of the Internet? Why should only those "serious about Internet commerce" be the ones to take advantage of the information the Internet has to offer? If you're worried about the Internet experience becoming devalued, it's too late. Many technology-savvy computer junkies already use the Internet no differently than our televisions and telephones. Speaking of telephones, I don't pay a per-minute charge to call my neighbor, so why should I pay per minute to use a local Internet provider?

Michael Thompson
Denver
michaelthompson@usa.net

YOUR MARCH 3 editorial was a riot. When the rates are raised, what are the anointed activities that aren't hogging? How about these?

1. Chat rooms — where people recommend Web sites to others?

2. Downloads of huge software packages by people who are too lazy to go to the store?

3. Game players?

4. Massive electronic-mailing campaigns?

5. The passing of huge files between companies as advanced shipping notices?

6. Online support by companies in too much of a hurry to put out bug-free products?

7. Shoppers who browse through the online stores?

8. People doing research who are too lazy to go to library?

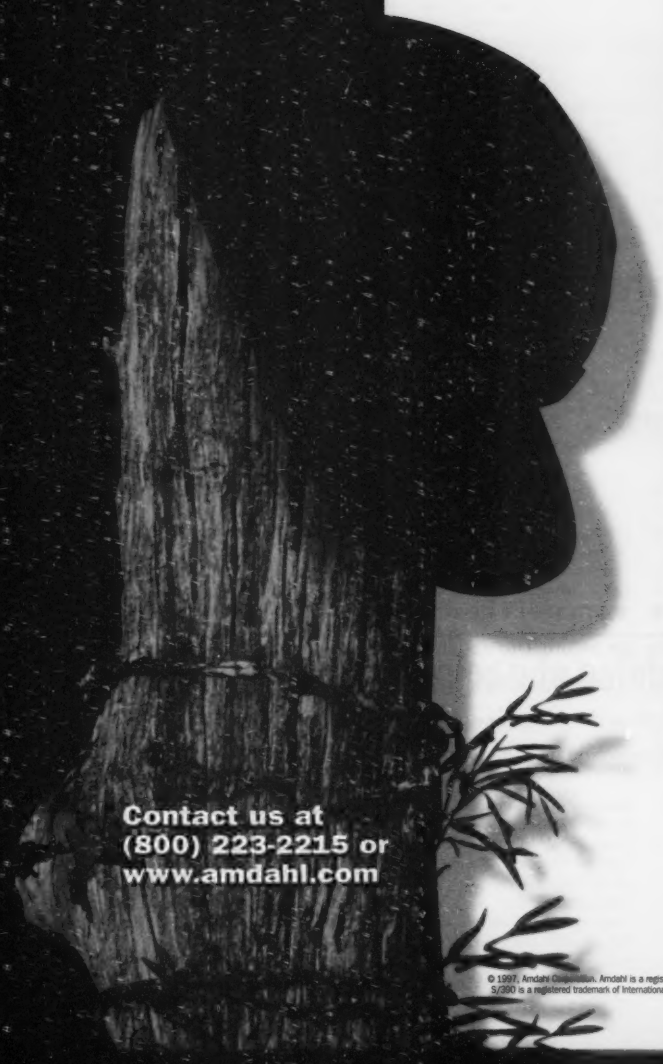
9. People doing online banking or grocery shopping?

10. Every activity but the ones I'm interested in?

So go ahead, raise the rates. Web sites with no viewers will really help the situation.

Noreen Kokes
Des Plaines, Ill.

ARE ALL YOU MIPS EA[illegible]NG THEIR K[illegible]EP?



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Servers & PCs

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Briefs

Secondhand blues

When IBM launched its radical PS/2 series, it gathered old PC, PC/XT and PC/AT models to dump offshore — literally — to create an artificial reef. Times

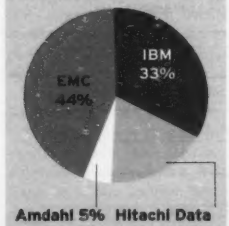
change. IBM Credit Corp. recently opened a store on the World Wide Web where shoppers can use a credit card to buy refurbished IBM PCs. The site, which is at mer.shop.ibm.com/shopping/ibmcredit, offers systems backed by a seven-day money-back guarantee and 90-day quality assurance.

More Casio handhelds

Casio Computer Co. said last week it will boost production at its plant near Tokyo to meet strong demand for its $500 Windows CE-based handheld PC. The Tokyo-based company, which sells the unit under its brand name, Cassiopeia, and makes models for Compaq Computer Corp., expects to ship about 500,000 CE devices worldwide in the year ending March 31, 1998, about two-thirds of them to the U.S.

MAINFRAME DISK STORAGE

Total 1997 petabytes shipped: 3.38*



*Projected

Source: Meta Group, Inc., Stamford, Conn.

MAC OS CLONES

Faster PowerPCs coming

By Lisa Picarille

USERS WAITING to get a PowerPC machine that offers performance equal to or better than that of the fastest Pentium desktop will have a new crop to pick from later this spring.

The systems were originally due last month but were delayed by a glitch in the design of IBM Microelectronics Division's PowerPC 604E running at 250 MHz. IBM officials declined to comment on the delay.

Two of the largest Mac OS-compatible makers — Power Computing Corp. in Round Rock, Texas, and Umax Computer Corp. in Fremont, Calif. — will instead deliver their respective 250-MHz machines later this month.

MARKET CREEP

That kind of aggressive push by clone makers several times in the past year has helped them beat Apple Computer, Inc. to market with faster systems and last year helped the Mac OS compatibles makers gain 11% of the overall Macintosh market, according to Computer Intelligence, a market researcher in La Jolla, Calif.

Sources close to Apple said the Cupertino, Calif., computer

PowerPCs, page 49

Parallel sysplex a slow migration

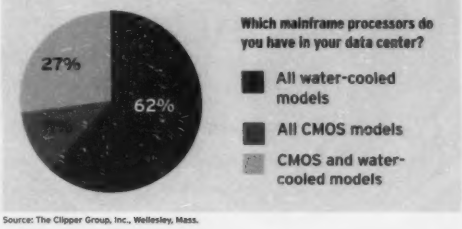
By Tim Ouellette

LARGE DATA CENTERS are slowly and steadily adopting parallel sysplex, IBM's mainframe clustering technology. But the fast pace of change in other areas of the mainframe market has other users taking a step back.

Among the changes for mainframe shops is a newfound breadth of product choice: Users can pick from a range of mainframe power and prices in hardware models, and popular client/server software packages such as SAP AG's R/3 are being ported to the platform.

At the same time, many data centers are taking on more responsibilities again as companies try to rein in unwieldy distributed systems.

Users are turning to parallel sysplex to phase in less powerful but more efficient CMOS mainframes



Source: The Clipper Group, Inc., Wellesley, Mass.

CUT COSTS

The adoption of parallel sysplex, which offers data centers the chance to bind together MVS mainframes to gain continuous availability, represents another trend. It allows users to cut back on software costs and purchase additional capacity in incremental units rather than with whole new systems.

"It is clear that parallel sysplex is a reality and is not something that will go away," said John Young, an analyst at The Clipper Group, Inc. in Wellesley, Mass. "But the way users embrace it is what will be different."

In a recent Clipper survey of

Parallel sysplex, page 47

Legal records hold court in CD-ROM

▶ *San Francisco storage firm maintains law firms' documents*

By Matt Hamblen
SAN FRANCISCO

IN MULTIBILLION-DOLLAR commercial lawsuits among major corporations, the volume of official documents could literally bury the attorneys. It isn't unheard of for lawyers to exchange 15 million pages during the initial discovery phase of a case.

In recent years, services to store digitized documents in CD-ROM farms have offered firms a way to replace an old law office habit — carting truckloads of papers to off-site warehouses.

"In the large cases, [this kind of service] is more affordable than the old way," said attorney Darin Snyder, a partner at an international law firm based here.

Saving documents digitally can also be a time-saver. "The way we used to [manually] search documents was so incredibly labor-intensive in large cases," Snyder said. He asked that the name of his firm not be used.

Snyder's firm uses Document Repository, Inc., a $4 million San Francisco-based company, to store images of its legal docu-

CD-ROM storage, page 49

High-speed MMX slips into notebook

REVIEW▶ *FutureNote MX200 notebook*

By Lenny Bailes

NOTEBOOKS THAT sport a special low-voltage 166-MHz Intel Pentium MMX processor have begun to make their presence felt in the mobile computing marketplace. Although Intel Corp. has yet to release a low-voltage 200-MHz MMX CPU for mobile computing, several vendors have built notebooks that incorporate Intel's standard desktop processors.

One example is FutureNote MX200, a 200-MHz MMX notebook that should be useful for mobile World Wide Web page designers and multimedia developers. Lek Technologies, Inc., a notebook vendor in Amarillo, Texas, has sidestepped Intel by mounting a standard desktop 200-MHz MMX CPU with a heat sink and cooling fan on a custom-designed notebook motherboard.

In addition to its 200-MHz CPU, the FutureNote includes an eight-speed CD-ROM, a 2.1G-byte hard disk and 40M bytes of RAM, all for less than $4,000. The FutureNote comes with a 12.1-in., 800- by 600-pixel thin film transistor display, 2M-byte Cirrus Logic, Inc. video adapter,

High-speed MMX, page 51

REVIEW▶
FutureNote MX200

Lek Technologies
Amarillo, Texas
(800) 284-8459
www.lektech.com

B

PRO
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CON
Lack of Advanced Power Management features

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Compaq eyes build-to-order model

▶ *Users raise backlog, quality control concerns*

By April Jacobs

COMPAQ COMPUTER CORP. is revamping its manufacturing and distribution model in a way it hopes will cut production costs and reduce the time it takes to ship computers to customers.

The Houston company last week said the new strategy includes changing the way it builds computers.

Instead of building products based on forecasts of what will be needed during the year, Compaq will manufacture computers on a build-to-order model.

And Compaq will let some resellers do more assembly work, such as installing memory, drives and software that a customer has specified.

Compaq said it will implement its strategy during the next two months.

Users' reactions to Compaq's new strategy were mixed.

Compaq's manufacturing and distribution model includes:

- Machines on a build and/or configure-to-order basis, rather than forecasted demand
- Allowing qualified resellers to assemble some products

PROBLEM CAUSER?

Although price competitiveness is important, users said they are concerned that Compaq's plan could result in order backlogs and quality control problems.

Ray Peterson, an information systems specialist at Wisconsin Indianhead Technical College in Milwaukee, said for several years he has been dealing successfully with Dell Computer Corp. on a configure-to-order basis.

But he said it takes time to build up a relationship with a reseller or vendor to ensure on-time product deliveries.

Kent Polzin, a senior technical operations manager at Simmons Co., a mattress maker in Atlanta, said he had bad experiences with reseller-configured machines.

In the case of Compaq, Polzin said, "The proof will be in the pudding as to whether it will work or not."

Roger Kay, an analyst at International Data Corp. in Framingham, Mass., said end users shouldn't notice any major changes based on where their computers are assembled.

But build-to-order models can take longer to get out the door, he said.

"Obviously, if you want a plain-vanilla, off-the-shelf product, you'll get what you want right away. But if they don't start building until you order, that can take longer," Kay said. □

Parallel sysplex migration

CONTINUED FROM PAGE 45

50 large data centers running between 200 and 500 MIPS of mainframe processing capacity, Young found that most users won't go fully to parallel sysplex for two years. But International Data Corp. in Framingham, Mass., estimated that nearly half of all MVS mainframe shops will be at some stage of parallel sysplex adoption this year.

MAINFRAME CLUSTERING

Users who are biding their time getting to parallel sysplex said they are concerned about the fast pace of mainframe operating system and hardware upgrades and options; the lack of overall support for parallel sysplex by many third-party software vendors; and the complexity of managing a number of new systems and software in a clustered environment.

RETESTING NIGHTMARE

For example, one user said the rapid upgrades to OS/390, the next-generation MVS operating system, would require users to retest all existing software on the planned sysplex. That could cause a management headache.

And others are waiting for IBM to break out of the MVS world.

"Parallel sysplex is stuck in the MVS universe. Until IBM extends it to the other S/390 environments, it really won't factor in to our decision process," said Tom Rae, manager of technical services at Westfair Foods Ltd. in Calgary, Alberta, a VM/VSE shop.

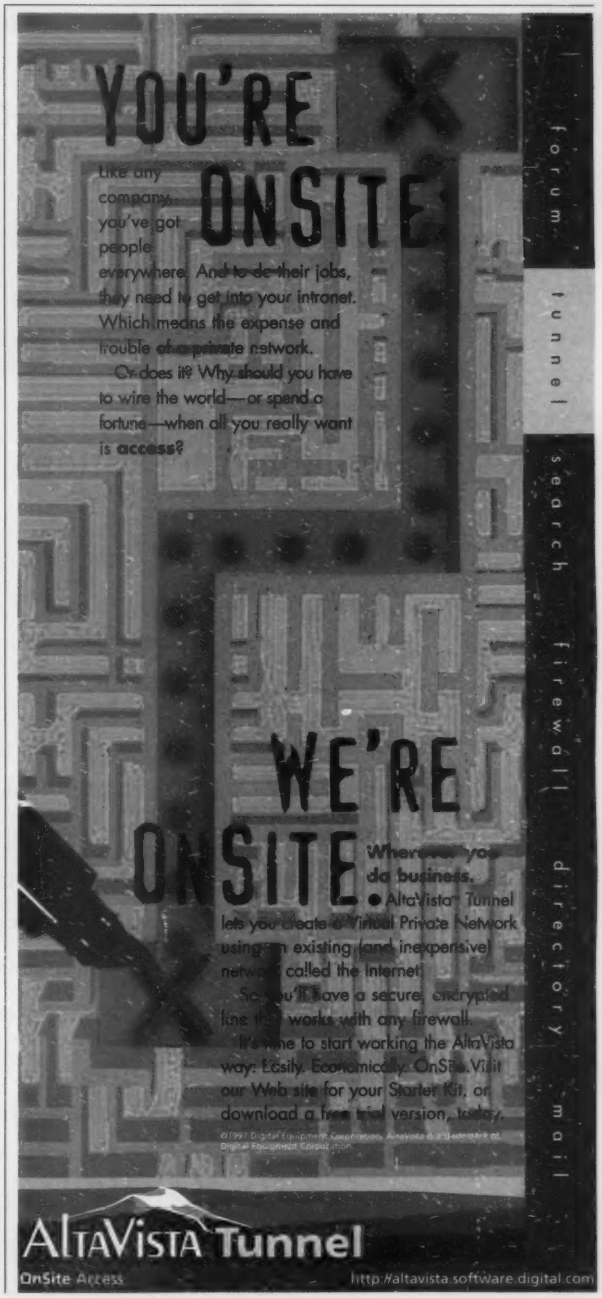
One option some users have taken to delay the move is to purchase Hitachi Data Systems' high-powered Skyline Series mainframes, which have enough capacity to manage large application loads, in many cases without mainframe clustering.

Still, early users who have bet their business on parallel sysplex have no regrets. For example, Duquense Light in Pittsburgh runs its customer information system — which is used to track complaints and reported power failures — in a two-system sysplex. "It really helps us with the cost of doing business," said James Moser, Duquense Light's manager of technical services. "And that is one of the key things I get beat up on in my job."

Like many companies trying the technology, the electric utility needed clustering more for the high availability than for garnering the software savings that come with buying one sysplex license vs. multiple mainframe licenses.

"For a while, storms [and outages] always came on Saturday night, which is our scheduled mainframe maintenance downtime," Moser said. "We now have the ability to do any maintenance without affecting operations at all."

Parallel sysplex requires that each S/390 system involved include specific software and coupling links, along with a coupling facility to manage the sysplex. The sysplex allows direct, concurrent read/write access to shared data from all processing nodes involved. It balances the workload accordingly among the processors. □



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For complete benchmark data, visit our web sites: **www.compaq.com** and **www.microsoft.com**

COMPAQ Microsoft

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PowerPCs on the way

CONTINUED FROM PAGE 45

maker plans to ship its own 250-MHz Macintosh models this summer.

250-MHZ POWERTOWER PRO

Processor: 250-MHz 604E PowerPC (single- or multiprocessor)

RAM: 32M bytes; can be expanded to 1G byte

Hard drive: Optional Jaz, Zip or 4G-byte drive

Slots: Six PCI

Miscellaneous: Onboard Ethernet, and 10Base-T, 8M-byte Twin Turbo graphics accelerator

Price: $4,495; $5,495 for multiprocessor version

Power Computing's PowerTower Pro 250, available later this month, will offer users the choice of a single- or multiprocessor Mac OS system running at 250 MHz and using the PowerPC 604E chip. Umax's SuperMac S900 604E/250 will be a uniprocessor system. Systems from both companies will feature 32M bytes of RAM, an eight-speed CD-ROM drive and a 2G-byte hard drive.

FASTER DELIVERY

With the delivery of its PowerTower 250, Power Computing has bested Apple at least six times in delivering the fastest Mac OS systems to users.

Users said the clones are gaining more appeal because of speed and Apple's moves — such as adding more multimedia capabilities to the Macintosh — to focus on its core customers such as graphics, publishing and multimedia professionals and leave the general business market to the clones.

Until now, NASA's Jet Propulsion Laboratory in Pasadena, Calif., has purchased almost all of its 4,800 Macintoshes from Apple. But that could change, said Alan Stepakoff, a technical staff member at the Institutional Computing and Information Services department.

"Apple has a strong focus on graphics and desktop publishing, but we use our Macs as general-purpose computers," Stepakoff said.

"If Apple starts to go down the graphics path too much, then we would seriously consider buying from the Mac OS clone makers. Their machines are more general-purpose and would suit our needs. That way, we're not paying for features we will never use," Stepakoff said. □

CD-ROM storage holds court

CONTINUED FROM PAGE 45

ments. The company stores the scanned documents and abstracts of their contents on hundreds of CD-ROMs.

"We look at ourselves as a huge library," said Christopher S. Kruse, president of Document Repository. "The key here is to get as much data online as cheaply as possible."

For its 120 law-firm customers, Document Repository keeps records on 1,500 CD-ROMs in San Francisco, Los Angeles and Seattle by using two types of devices: 150 legacy CD changers from Pioneer New Media Technologies, Inc. in Long Beach, Calif., and seven Mercury jukeboxes from NSM Jukebox in Bensenville, Ill. The single-drive CD changers hold six CDs each. The four-drive jukeboxes each hold up to 150 CDs, or 100G bytes of data.

The legal documents are scanned by another contractor and kept as Tag Image File Format files on the CDs so they can be downloaded and printed. Printed documents are the only format allowed in courts, but keeping so much paper isn't practical. Kruse said.

He said he prefers to rely on fewer devices that can fail or cause access delays for his clients.

Several law firms have online T1 networks to access the CDs, but Kruse said his company hasn't made the information available over the Internet, because of security concerns.

Document Repository's customers are often multiple law firms that represent several insurance companies sued by a large company in a single case.

Document Repository's services cost about 1 cent to store a scanned page and up to 20 cents to retrieve and print a page. Other contractors do the scanning for up to 15 cents per page and write content summaries for $1 to $2 per abstract.

Document Repository faces competition from a variety of companies, including national service firms such as Quorum Litigation Services in Minneapolis. Another company, Virtual Repository, Inc. in Boulder, Colo., offers its document storage service via the Internet. □

NEW PRODUCT

CANON USA, INC. has announced CFX-L4500 IF, a five-in-one desktop laser printer.

According to the Lake Success, N.Y., company, CFX-L4500 IF allows printing, PC-faxing, scanning, telephone functions and copying.

Incoming faxes are held in memory when the machine runs out of paper or toner. It costs $1,695.

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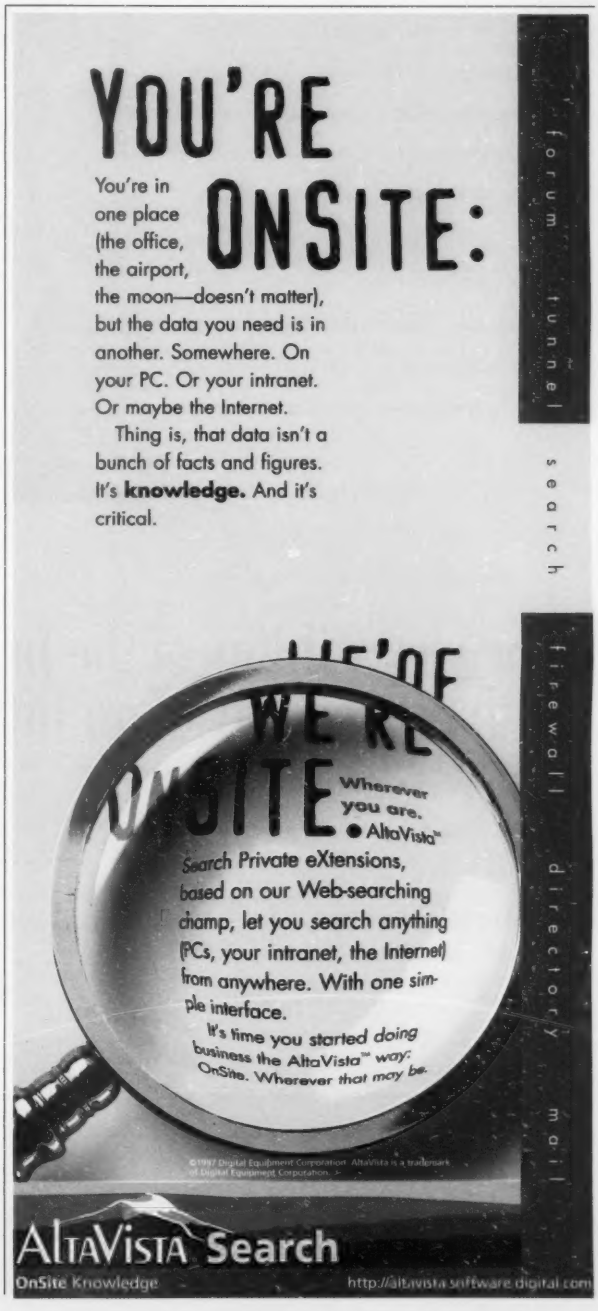
www.usa.canon.com



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UUNET

REVIEW▶ *FutureNote MX200 pumps up speed*

High-speed MMX slips into notebook

CONTINUED FROM PAGE 45

stereo sound card and onboard microphone.

The heat generated by the 200-MHz desktop CPU posed no problems that I could observe. I ran the FutureNote for up to 12 or 13 hours on its AC power adapter, and it grew no hotter than any common notebook computer.

But a lack of sophisticated power management features separates the FutureNote from notebooks sold by first-tier vendors.

The 3V cooling fan that keeps the notebook operational takes its toll in the power department. The FutureNote's nickel metal hydride (Ni-MH) battery provides only 60 to 70 minutes of computing time. That can be a problem for users who expect their battery to survive a transcontinental flight. Most current notebooks use slightly more expensive lithium batteries that deliver 3 to 4.5 hours of computing time. A second Ni-MH battery for the FutureNote can replace the CD-ROM drive, bringing total non-DC adapter time to about 2.5 hours.

Lek didn't wait for a notebook-specific 200-MHz Pentium MMX chip set

BATTERY WOES

The unit lacks a suspend-to-disk feature, won't automatically shut down and restart when you close the lid and has only partial support for Windows 95 Advanced Power Management — the Windows 95 battery meter doesn't work on the FutureNote, and there is no LED power gauge.

The bottom line is that the FutureNote keeps draining the battery if you close the lid without hitting the suspend button, and it is tough to judge the remaining battery time.

Compliance with Windows 95's Advanced Power Management 1.1 standard would be ideal, but even an LED battery gauge built in to the notebook would be helpful.

The FutureNote performed satisfactorily on the benchmarks and application tests I threw at it. To measure ordinary application performance, I ran the 32-bit Microsoft Word and Excel tests from *PC World*'s PCWorld Bench Suite. I tested the computer's MMX capabilities by clocking the time consumed in resizing and filtering a large bit-map photo in Adobe Systems, Inc.'s Illustrator 4.0, an MMX-enabled application.

MIDDLING PERFORMANCE

On the application tests, the FutureNote placed roughly in the middle of the non-MMX 166-MHz desktop models in *PC World*'s comparison database and significantly higher than any of the 120- to 133-MHz "power notebooks." That performance measurement is par for the course. Notebook computers often score 20% to 30% behind their desktop counterparts with identical CPUs.

For an Adobe Illustrator comparison I expanded a high-color bit-map photo and applied several of Adobe's special-effects filters. After testing the FutureNote, I transferred its hard disk into a clone 166-MHz MMX desktop machine and applied the tests again. With a full complement of 40M bytes of RAM, the 200-MHz FutureNote was approximately 10% faster than the 166-MHz desktop machine at executing PhotoShop image manipulations. When I reduced the FutureNote's available RAM to 32M bytes, it was approximately 20% slower than the desktop machine.

THREE OPTIONS

The FutureNote's clean, sharp thin film transistor display makes it well-suited for multimedia production work or Web page construction on the go. The unit is sold in three basic configurations that include the 200-MHz processor; a 16M-byte, 10.4-in. active-matrix model with 1G-byte hard disk, the same configuration with the 12.1-in. display; and the unit I tested, with 40M bytes of RAM and a 2.1G-byte drive.

Additional feature options sold separately include a 33.6K bit/sec. PCMCIA modem, port replicator and docking station.

The unit weighs approximately 7 pounds with the CD-ROM drive inserted.

For users who aren't concerned with transcontinental battery-life issues, the FutureNote is an impressive machine economically priced with brisk and reliable performance. □

Bailes is a reviewer in San Francisco.

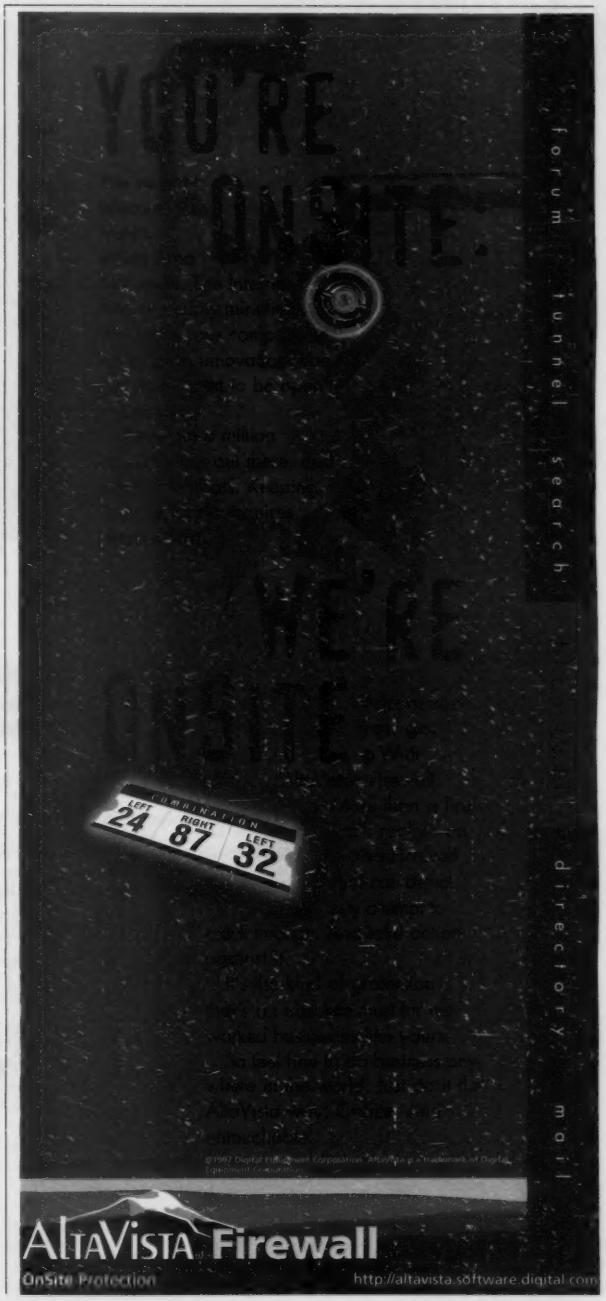
NEW PRODUCT

3M has announced Post-it Software Notes, Post-it Signs and Post-it Notes for Ink Jet and Laser Printers.

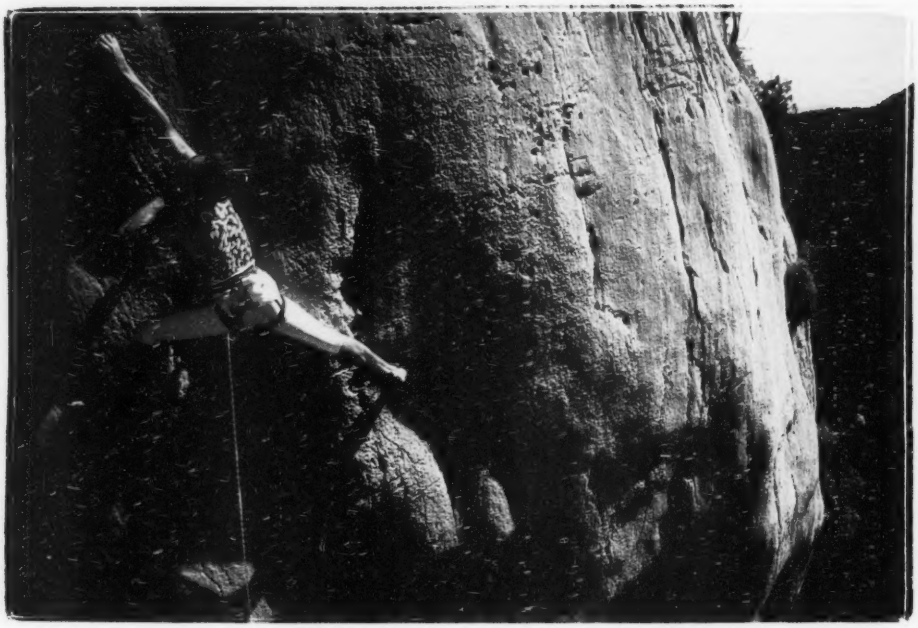
According to the Roseville, Minn., company, the product lets Windows users create reminders, organize and communicate by clicking on an electronic notepad accessible from all applications. The signs and notes for printers include sticky backing that can be run through a printer to imprint the message a user has created digitally.

The software and a starter kit of notes for printers sell for $24.99 each; the signs sell for $18.99.

3M
(800) 330-3966
www.mmm.com



Sure, reaching goals means taking chances.



Fortunately, choosing the right client/server accounting solution doesn't have to be one of them.

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Software

Client/Server • Development • Operating Systems

Briefs

Orbix links to MQSeries

Iona Technologies has announced a tool kit that will link the Cambridge, Mass., company's Orbix object request broker with IBM's MQSeries middleware. The Integrated Messaging Agent allows developers to create object applications that take advantage of MQSeries' reliable and scalable data messaging infrastructure. Pricing isn't yet available. The product is expected to begin beta testing this quarter.

LifeKeeper for R/3

NCR Corp. in Dayton, Ohio, and SAP AG in Germany last week announced that they have integrated SAP's R/3 business application with NCR's LifeKeeper software and Informix Corp.'s database software. The move gives users high levels of availability for SAP applications running on Windows NT. LifeKeeper is NCR's middleware for hardware and software fault-detection.

Level8 middleware

Level8 Systems, Inc. in New York is shipping Distributed Object Transactions (DOT/XM), messaging middleware. DOT/XM includes tool sets and Common Object Request Broker Architecture (CORBA) object request brokers to create distributed applications that span PC systems and mainframes. A Transaction Flow Engine lets one client include access to multiple back-end legacy systems. Prices range from $35,000 to $70,000 for Unix and mainframe systems; runtime client licenses range from $2,000 to $15,000.

R/3 for DB2 on NT due

German software giant SAP AG and IBM said they are developing a version of SAP's R/3 application package for IBM's DB2 database running on Windows NT. IBM and SAP are also creating an integration and support center for customers using R/3 on IBM databases. The NT offering is scheduled for release by year's end.

Wed to the Web

▸ *Java/CORBA combo may help IS get legacy systems online*

By Sharon Gaudin

"Because we've standardized on one platform, giving Web-enabled access is very easy for us." – Bill McGarry, Owens Corning

COMPANIES ARE ON the Web and are ready to do serious business with their customers.

That means they need to take information strewn across myriad servers out of hiding and put it on the World Wide Web. Combining database access with the power of the Internet is the key.

"Internet-enabling legacy information is the next fight," said Paul Mahowald, vice president of retail systems at Fort Lauderdale, Fla.-based Blockbuster Entertainment Group. "That's where all the action is going to be for the next year. It's all about the ability to get customers to see your data — where their product is in the pipeline, billing — all without phoning in to talk to people."

To accomplish that, Mahowald said he is considering using Sun Microsystems, Inc.'s upcoming JavaBeans/Common Object Request Broker Architecture (CORBA) combination [CW, March 24]. JavaBeans is a desktop architecture designed to speed data across the public Internet and corporate intranets. CORBA is an industry-standard architecture that works across client/server networks.

Sun is expected to announce this week that the two architectures will merge, making CORBA the connecting pipe that enables clients and servers to communicate across multiple

Wed to the Web, page 54

Tool brings statistics to masses

By Randy Weston
SAN DIEGO

SAS INSTITUTE, INC. is trying to bring the power of data mining and statistical analysis to even the most unsophisticated users.

At its recent user group conference here, the Cary, N.C.-based company unveiled a client/server data mining tool called Enterprise Mining for its Orlando 2 data warehouse suite.

It was designed to let users such as marketing and sales departments create statistical-analysis models. Built with its graphical user interface, Enterprise Mining includes tools that walk users through the model-building process so those without much technological experience can take advantage of data mining systems.

For example, marketing people can use it to analyze sales trends and make strategic business decisions based on the results. The marketer for a toy manufacturer, for instance, may use it to predict what will be next Christmas' Tickle Me Elmo doll.

Henry Morris, an analyst at International Data Corp. in Framingham, Mass., said the demand for this kind of technology is increasingly coming from the business side of corporations beyond the statisticians,

Statistics, page 60

Warehousing still a hands-on process

▸ *Lack of tools keeps IS busy on big projects*

By Craig Stedman

IT STILL don't come easy.

Those are words of hard-earned wisdom from more than a half-dozen information systems managers wrestling with data warehousing projects that involve hundreds of gigabytes or more of data.

CLOSER LOOK
Data warehouse scalability issues

For the most part, they said, building and managing big warehouses so analysis-minded end users can get at the historical information in a timely manner remains a manual slog for IS departments. Blending data from a wild mix of production systems chews up resources, and then warehouses have to be continually modified to keep up with changing business needs. Database designs that work at first may not scale up as the amount of data grows.

Ensuring fast query response times on a terabyte-class data warehouse "is enough to keep two or three database administrators challenged full-time," said Brenda Moncla, senior director of information management and support services at US West Communications, Inc. in Denver. "And they're doing it in an extremely manual way today," she said.

It isn't that there is nothing new in the realm of packaged warehousing tools. In recent

Warehousing, page 54

Nutcracker Unix-to-NT tools ease application porting

By Jaikumar Vijayan

DATAFOCUS, INC. last week announced an enhanced version of its Nutcracker suite of software tools for porting Unix applications to Windows NT.

The software helps reduce complex porting issues and cuts the cost and time required by programmers and software developers to port applications from Unix to Windows NT, observers said.

The ports allow users to run their existing Unix applications virtually unchanged in Windows NT environments.

Nutcracker is a set of compatibility libraries that allow Unix source code to compile with the Win32 application programming interfaces on Windows NT so applications appear to become native Win32 executables, said Patrick Higbie, CEO of DataFocus. The applications require Nutcracker to be present on the NT server to run.

"Such tools provide users with a relatively painless way to migrate applications away from Unix to Windows NT," said Bob Tasker, a vice president at The Yankee Group in Boston.

"And it is an approach that cuts migration costs," he said.

Nutcracker, page 60

NUTCRACKER 3.0 ALLOWS:

- Applications to be ported from any brand of Unix to Windows NT with little or no modification.
- Ported applications to be optimized and integrated with other Windows NT applications.

Warehousing is still hands-on

CONTINUED FROM PAGE 53

months, various vendors have released products that promise to automate the chores of managing and monitoring data warehouses (see chart below).

But most of the emerging tools come from start-ups or are tied to an individual vendor's end-user analysis software. Packaged tools for building and loading data warehouses still don't measure up to many big projects, Moncla and other IS managers said. That forces companies to learn their own tricks for keeping warehouses from choking on queries.

The tricks of the trade include the following performance boosters:

- Putting subsets of data into smaller data marts, which can have a long life span or be purely temporary vehicles for answering specific questions.
- Building summary tables, indexes, multidimensional "cubes" and data-locator keys that reduce query run times.
- Tracking warehouse usage via homegrown tools or personal contact with end users so changing business needs don't swamp the system.
- Throwing more hardware at problems when all else fails.

"A data warehouse is so user-driven that it has almost infinite demand [for performance], especially because our business units are still figuring out how to use all of the data," said Howard Edels, chief information officer at CVS Corp. in Woonsocket, R.I.

CVS has 1T byte of pharmacy data in an Oracle Corp. database and will add a separate 500G-byte warehouse for analyzing product sales in the retail portion of its chain stores.

But to get acceptable performance, CVS routinely builds minimarts for business analysts who need to play with a specific set of data for a week or two. "That makes more sense than having them go to the raw data all the time," Edels said.

Anthem, Inc., a $6 billion health insurance company in Indianapolis, is putting locator keys on each record in a 650G-byte corporate warehouse that is due to go into production by midyear. That should make queries simpler and faster for end users, said Joe Bruscato, an advisory database consultant at Anthem. "But from an administrative standpoint, it's pretty close to a nightmare," he said.

Anthem has been working for 18 months on the merger-driven project, which combines three warehouses from previously separate companies into a single pool based on NCR Corp.'s Teradata database. Anthem had hoped to use packaged data-extraction tools but ended up writing its own "very SQL- and Cobol-intensive code" to ensure performance, Bruscato said.

Mapping data into a warehousing format that runs queries fast and summarizes the information in a widely useful way "is tremendously labor-intensive," said Michael Wade, senior manager of revenue reporting systems at MCI Communications Corp.'s business markets group in Atlanta. "It's like solving calculus problems."

Wade is managing development of a series of Informix Software, Inc.-based data marts totaling 600G bytes. Divining how best to summarize data is complicated by the fact that different users "each want to see things in a particular way," he said. "And there really is nothing out there [in terms of tools] that helps you."

Approaches that work with small amounts of data may have to be scrapped as more information comes into play, some warehouse managers warned. For example, the communications equipment unit of Lucent Technologies, Inc. in Basking Ridge, N.J., is investing more than $3 million to revamp a financial warehouse that is growing from 25G to 250G bytes.

Part of the money will buy a more powerful parallel processor from NCR, said Mark Frazier, staff manager for finance systems at the Lucent unit. But Lucent is also redesigning its Teradata database because an earlier approach of prebuilding all data joins for users would waste space and be impossible to maintain as the warehouse expands, Frazier said. □

WAREHOUSE TOOLBOX

A sampling of recently announced data warehousing software

Product/Vendor	Description	Price
Intelilidex Warehouse Control Center Intelilidex Systems	Synchronizes metadata and handles central administration and navigation	Starts at $40,000
Universal Directory LogicWorks	Inventories metadata in a central directory and provides search tools	Starts at $30,000
Data Usage Tracker Pine Cone Systems	Part of a tool set that monitors and analyzes warehouse usage and growth	$7,500 to $60,000 per tool
DSS Administrator MicroStrategy	Manages and monitors warehousing applications with MicroStrategy's DSS Server analysis software	$35,000 per DSS Server installation
SAS/Warehouse Administrator SAS Institute	Generates metadata and manages warehouse applications involving SAS' Orlando II analysis software	Starts at $35,000
Clear:Manage Sterling Software	Tracks end-user data access with Sterling's Clear:Access analysis software	Starts at $7,500
Orchestrate Torrent Systems	Builds warehousing and data mining applications on parallel processors	$8,000 per processor

Staying up to speed

When you're talking about terabyte-size data warehouses, storage management becomes a thorny topic.

Cost is one issue. Storage may not be the budget-buster it once was, but analysts said a terabyte's worth of disks can still go for $1 million or more. Data warehouse managers said they also have to keep a close watch on how data is stored to help keep queries from hitting the brakes.

"It's not something that you can look at once and then let it go," said David Buch, director of data warehousing technology at Capital One Financial Corp. in Falls Church, Va. Capital One constantly scans its six big Oracle Corp.-based data marts to find performance-throttling hot spots or seldom-accessed dead spots that could be moved to tape to free up disk space.

The credit-card company's data marts hold more than 2T bytes, which pushes the limits of how much storage can be directly attached to its Unix servers, Buch said. Capital One has started to write some of its own storage monitoring tools because vendors provide only "elementary stuff," he said.

"You're constantly balancing storage capacity with performance and usability issues," said Michael Wade, senior manager of revenue reporting systems at MCI's business markets group in Atlanta. — Craig Stedman

Wed to the Web

CONTINUED FROM PAGE 53

platforms.

"JavaBeans allows you to quickly and easily build thin-client applications that can be distributed on many platforms. It runs well with the Web, which is all about distributed access," said David Bowser, a systems architect at Cummins Engine, Inc. in Columbus, Ind.

Bowser, who will present his work at the JavaOne conference in San Francisco this week, has been using a CORBA/Java combination to channel the reams of information in his eclectic mix of databases onto the Web so his customers can easily access needed information.

"Businesses have all this information in their legacy databases, and they're screaming to get this information out on the Web," Bowser added. "CORBA is becoming the standard of providing access to any kind of server. Putting the two together simplifies this problem."

Evan Quinn, an analyst at International Data Corp. in Framingham, Mass., said moving legacy database information onto the Web will be an integral part of many information systems strategies over the next few years.

"Doing business means getting into the data," said Quinn, who noted that there are many ways for information systems managers to move their legacy data into a position where it can be accessed for the Internet. The core issue will be the labor and expense of making that happen.

That's one good reason why the Internet rapid application development (IRAD) tool business is picking up a lot of steam these days.

Developers are using IRAD tools, such as Symantec Corp.'s Visual Cafe and Microsoft Corp.'s Visual InterDev, to move their information onto the Internet, Quinn said.

Bill McGarry, director of IS architecture at Owens Corning in Toledo, Ohio, said he has converted his company's information off legacy databases and onto an SAP AG system. And that move has given his customers access to that information via the Internet.

"We're finding that more and more customers have direct access through the Internet, and this gives them the convenience of checking on orders and shipments," McGarry said. "And it's a lot more simple for us in terms of support. It does alleviate the need for labor resources answering the phone and answering fax requests."

McGarry said the move to SAP at the company's 21 facilities cost $100 million.

"We find that we are expecting $50 million in annual return on that investment," he added. "Because we've standardized on one platform, giving Web-enabled access is very easy for us." □

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FRANKLY SPEAKING

Test early and often

FRANK HAYES

IF AIRPLANES WERE BUILT by corporate IS shops, the railroads would still be thriving today.

Consider how two big projects ended — one from an airplane builder, the other from software developers.

To test the new Boeing 777 airliner in 1994, a pilot got the plane going at takeoff speed — more than 200 mph — and hit the brakes. By the time the 777 stopped 2.5 miles later, the brakes were glowing bright orange, and it took 14,000 gallons of water to cool them down from 3,000 degrees. But the 777 didn't crash or burn. The brakes passed the test — on the first try.

In contrast, a major software project at a large Midwestern bank couldn't pass *any* tests when it was officially declared complete a few years ago. But the schedule said it was time for the project to be done, and so it was, complete with a rigged demo for management. "Now we'll just keep making enhancements until users can actually do something with it," one developer told me at the time. "That should be about Version 1.1."

We've all seen that scenario before: Developers write buggy programs that fall behind schedule. Project managers cut corners, slash features and lie to the boss to keep the project alive until the finish line. Then users have to put up with uncomfortable, dysfunctional and crash-prone applications.

Would you want to fly in an airplane built like that? Not unless you're really dying to test your life insurance.

But, of course, you don't have to. And for the most part, architects and engineers make sure that you don't have to live in a house, work in an office building or drive a car that's cobbled together that way, either.

How come they can do that and software developers can't? One clue is that, when Boeing performed that brake test on the 777, everyone *expected* the plane to pass. But when software developers hand over an application to the quality-assurance team, or to users, everyone assumes there are plenty of bugs left to find.

Boeing's engineers had good reason to believe that the 777's brakes would pass. They had been testing those brakes, and every other part of the airplane, every step of the way since the plane's initial design.

But IS shops are looking for bugs in all the wrong places. In a developer's outbasket. Or on a user's screen.

That's too late. By that point, major bugs are amazingly hard to fix. And design errors, which are really just bugs in an application's design instead of its code, are impossible to reverse.

Ironically, if testing began right after developers started their work, a lot of those most miserable bugs could be caught and corrected long before they become big problems. Testing-tool vendors have spent the last few years making their products easier to use early in the development cycle.

If each phase of a software development project had to pass a milepost clean and bug-free, not only would bugs and design errors get hammered out, but development managers would have a much better handle on how much schedules were slipping. Next time, they could estimate the schedule more precisely.

But whether the cause is management directives, schedule crunches or not-my-jobism, too many projects still leave bug-finding until the end.

That test-as-you-go approach is no magic bullet. It won't solve all your development problems — especially the ones coming from schedule-crazed bosses who'd rather have a rigged demo than useful software.

But it could give your next software project a real chance not to crash and burn. □

Hayes is Computerworld*'s staff columnist. His Internet address is frank_hayes@cw.com.*

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TRANSACTION PROCESSING

HP-UX to get Web-enabled IBM apps

By Kristi Essick
LONDON

HEWLETT-PACKARD CO. and IBM will work together to develop and market IBM's World Wide Web-enabled transaction-processing products for the HP-UX Unix operating system, the companies said last week.

Although the companies didn't specify exactly which IBM software products will be available in this bundle, officials did say that Version 2 of IBM's CICS transaction-processing system will be included.

Availability dates for the bundle weren't announced.

Officials also said that other IBM products will be optimized for HP-UX in the future.

The aim of the marketing agreement is to offer electronic commerce and Internet-based enterprise software solutions to HP-UX customers, officials said.

"Customers need help to exploit the benefits of electronic business," said Mark Elliott, general manager of worldwide sales and marketing at IBM, in a statement.

"This partnership provides our customers with network solutions that will allow them to meet the demands for globalization, increased responsiveness and lowered cost," he said.

IBM in Armonk, N.Y., and HP in Palo Alto, Calif., said they will launch a joint marketing campaign that will include a combination of product sales, reseller education sessions and business-partner programs. □

Essick writes for the IDG News Service in London.

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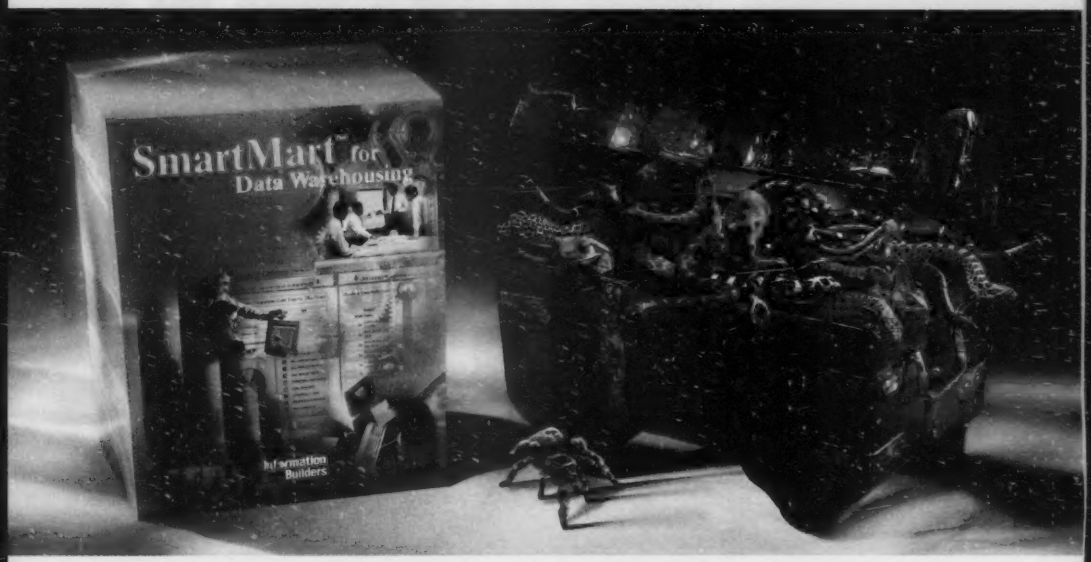

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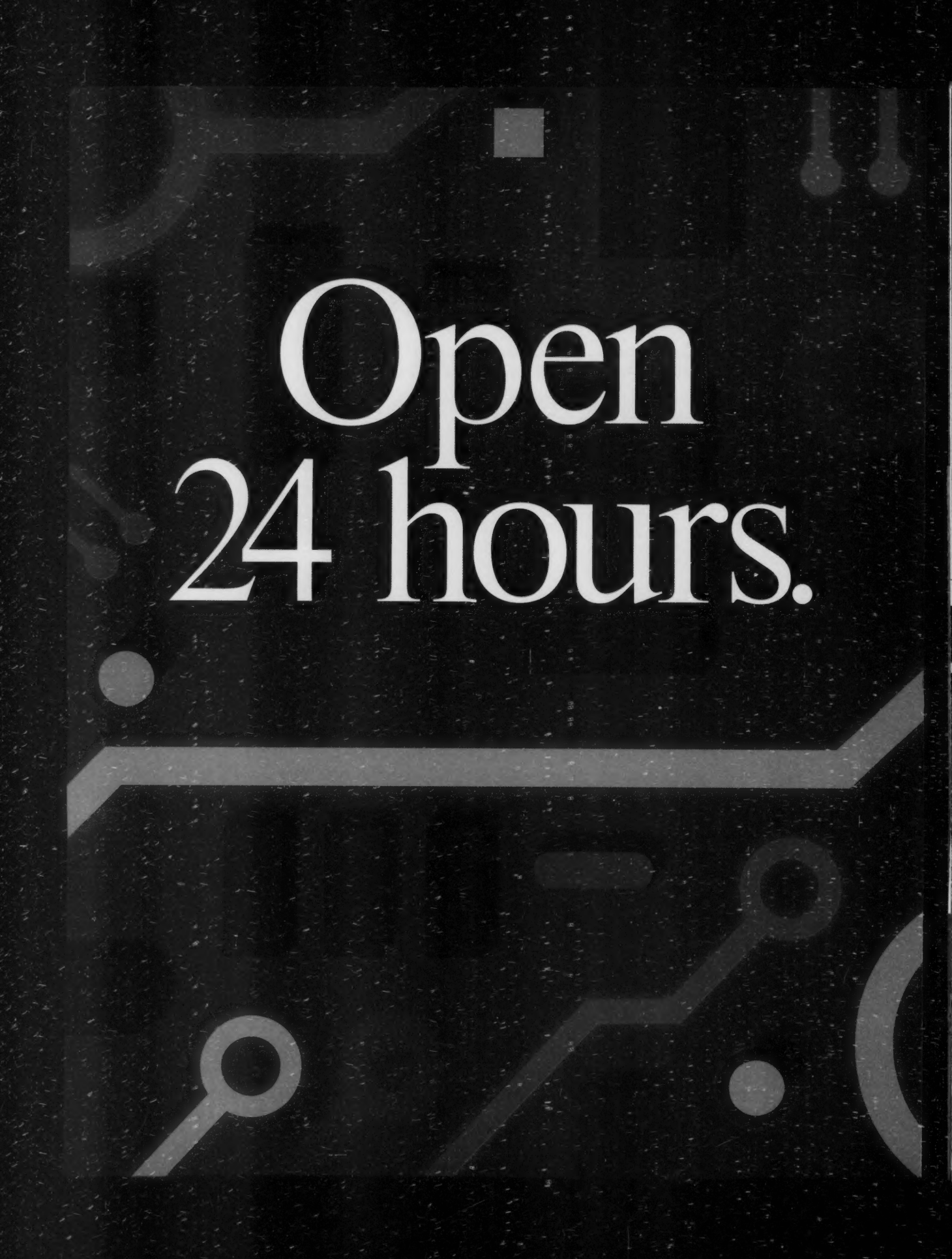
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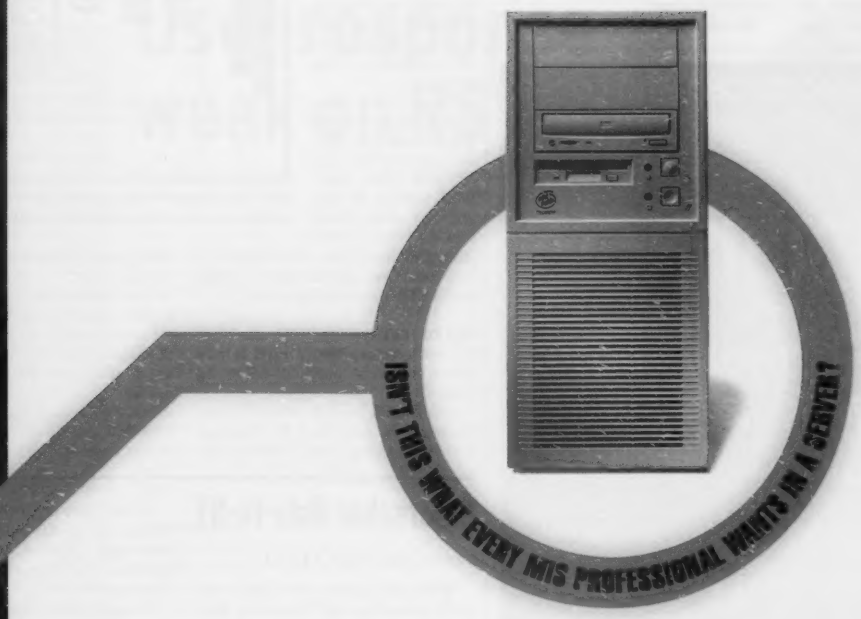

Unfortunately, it is not always what you can expect. That's why more and more organizations, both large and small, are choosing scalable, dependable Standard High Volume (SHV) servers based on Intel architecture processors like the Pentium® Pro processor.

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Tool brings statistics to masses

CONTINUED FROM PAGE 53

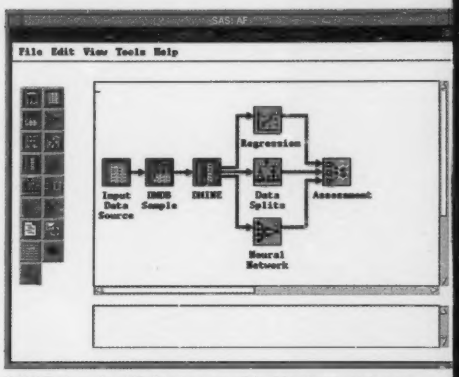
who have traditionally been the only users.

Enterprise Mining will also let users choose multiple types of algorithms and compare the different modeling techniques in one graphic. Then users can choose the one that best meets their needs based on the model results.

"Data mining is like any other application and should be taken to any business area," said David Sellar, manager of medical analysis at Oxford Health Plan, Inc. in Norwich, Conn.

The demand for this type of functionality led Sellar's office to help SAS develop the new application. Sellar said many of the business department users, such as account managers, wanted this type of application to spot medical trends among the health maintenance organization's 1.7 million members and initiate preventive measures.

"There's lots of information that wouldn't pop out with your standard open reports," Sellar said. "Our users don't want to sit back and wait to see members end up in the [emergency room] when six months ago they could have used this type of system and identified a medical problem."



SAS' Enterprise Mining has graphical tools so even nontechnical users can build models of data mining applications

NOT FOR EVERYONE?

But not everyone sees a need to turn over this type of analytical tool to the masses.

Tom Roberts, head of software partner marketing at The Dun & Bradstreet Corp. in Stamford, Conn., said this type of data analysis is necessary only a couple of times a year.

"Just because you can do something doesn't mean you should," Roberts said. "It is unrealistic to say you need this type of analysis every day. You can't possibly use it or react to the information that quickly."

The software will enter beta testing in June, with general availability scheduled by year's end. Pricing hasn't been set. □

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Nutcracker Unix-to-NT

CONTINUED FROM PAGE 53

"Nutcracker has proved to be a very useful product for us. It has really saved us money and bring products to market quicker," agreed Dan Sullivan, development manager at Domain Solutions, Inc., a developer in Cambridge, Mass.

The company has used Nutcracker for the past six months to port applications from both Digital Equipment Corp.'s OpenVMS and various flavors of Unix to Windows NT.

The approach provides a cost-effective and quick route to integration of Unix and NT, but the performance of applications ported using such techniques is lower than those that have been completely rewritten for NT, observers said.

The Fairfax, Va.-based DataFocus is among a handful of third-party vendors that offer software to help developers migrate Unix applications to Windows NT, according to analysts. Another company that has similar software is Softway Systems, Inc. in San Francisco.

Unix applications that Nutcrcaker can help to port to Win32 include daemons, X/Motif and character-based software built in C, C++ and Fortran. Applications can be ported from Sun Microsystems, Inc.'s Solaris, Hewlett-Packard Co.'s HP-UX and IBM's AIX flavors of Unix.

ENHANCEMENTS

Version 3.0 of Nutcracker, announced last week, extends the number and type of Unix applications that can be ported to Windows NT.

For instance, the latest version integrates Windows implementations of Unix software from a number of companies such as SCO, Inc. in Santa Cruz, Calif., Mortice Kern Systems, Inc. in Waterloo, Ontario, and Hummingbird Communications Ltd. in Mountain View, Calif. New features include support for SCO's XVision Eclipse and a PC X server that lets end users run Unix and Windows applications together in an integrated Windows environment. □

S H O R T S

Apple offers support

Apple Computer, Inc., which is cutting back on its own research and development staff, recently announced it will become a premier sponsor for the Center for Software Development, a nonprofit group in San Jose, Calif. The center, founded in 1993 to provide technical and business development resources to software developers, said Apple will provide a mix of hardware, full-time Mac OS technical support and marketing help. The center has a mix of PCs, Unix workstations and software titles to be used in testing.

AS/400 paging help

Help/Systems, Inc. in Minnetonka, Minn., has announced Robot/Alert 4.0, AS/400 paging software. Version 4.0 includes a graphical user interface to allow changes to the paging requirements from a PC. Prices range from $1,500 to $5,000.

The Enterprise Network

LANs ♦ WANs ♦ Network Management

Briefs

Cisco to go gigabit

Cisco Systems, Inc. recently provided a glimpse of its Gigabit Ethernet plans by announcing a technology that lets users provide faster connections from its LAN switches and routers to servers. The San Jose, Calif., vendor said that next year it will equip its Catalyst 500 LAN switches and 7500 routers with Gigabit Ethernet. Cisco also detailed Fast EtherChannel, a scheme that lets its devices combine multiple 100M bit/sec. Ethernet pipes into "superpipes" in 200M bit/sec. increments.

R/3 tool for AS/400

New Dimension Software in Irvine, Calif., last week enhanced its Control-M job control and scheduling software to provide unique support for SAP AG's R/3 applications running on IBM AS/400s. The tool lets managers link a complex series of processes — such as file updates, transfers and backups — across the AS/400 and all other systems supported by Control-M. Pricing starts at $32,000.

Inventory tool added

PinPoint Software Corp. in San Jose, Calif., has added automatic inventory software to its ClickNet network design and documentation tool. ClickNet ADS4000 can examine connected stations to log their hardware and software configuration in the central database so managers don't have to input or import such information. The software costs about $7 per node.

Worldwide shared Ethernet hub revenue

Second-half 1995
$1.78B

First-half 1996
$1.74B

Second-half 1996
$1.65B

Source: Dell'Oro Group, Portola Valley, Calif.

NETWORK BANDWIDTH

User response weak on RSVP

By Bob Wallace

SOME USERS have concerns about a long-promised protocol that would let information systems managers book network bandwidth like they reserve a restaurant table.

The Resource Reservation Protocol (RSVP) will let routers in packet networks reserve bandwidth paths across networks for high-speed traffic streams — from videoconferencing or audio applications, for example — that can't tolerate delay.

NO STANDARD

RSVP has broad support among internetworking vendors, and routers that support it have just started to ship. But the RSVP specification isn't yet a standard and may not become one for several months. Some users have dodged the bandwidth scarcity issue by opting for high-capacity networking technologies such as Asynchronous Transfer Mode (ATM).

"RSVP is still largely unproven, and it's still in committee," said Peter Pollack, vice president and chief technologist at MTV Networks/Showtime Networks, Inc. in New York. "It's yet to be seen if routers with RSVP can handle the work of reserving thousands of bandwidth streams for high-speed traffic. ATM's quality of service [scheme] can be a better solution."

ATM uses cells that are larger than packets and better suited to simultaneously transmitting

RSVP, page 65

Big nets seek fail-safe IP addressing

▸ *Vendors revamp to boost task automation*

By Patrick Dryden

VENDORS ARE overhauling address-management software for TCP/IP networks to automate a minor task that can cause major headaches if done wrong.

In large networks, the process of manually assigning Internet Protocol addresses to machines that often move can result in duplications and other errors that disrupt communications and require arduous troubleshooting.

COMMUNICATION LACKING

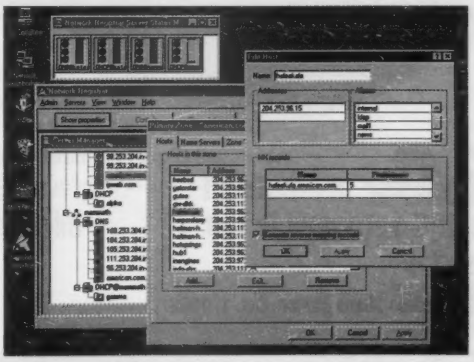
For many managers, standard versions of IP address management tools suffice. Those include implementations of the Dynamic Host Configuration Protocol (DHCP), which assigns a unique IP address to machines logging on to the Internet, and domain name servers (DNS), which map host names to physical IP addresses during access attempts.

"But DNS and DHCP don't really talk to each other, so conflicts can prevent access when a name doesn't get updated with its assigned address," said Tom Bain, a senior research analyst at Meta Group, Inc. in Westport, Conn.

Rolling out new services and applications in large TCP/IP networks is difficult without tools designed to ease the assignment and resolution of IP addresses and prevent duplication, Bain said.

Sharing the lead in the fledgling $20 million IP address tools market are Isotro Network Management, Inc. in Ottawa

IP addressing, page 65



AIC has written its own integrated DNS and DHCP servers to simplify IP address management

IBM expands OS/2 Warp client support

By Laura DiDio

IBM HAS released two beta offerings that were designed to cement OS/2 Warp Server's hold within its installed base by tying it more closely to Microsoft Corp.'s Windows NT Workstation and Windows 95 clients.

Warp Server moves closer to Windows NT.

IBM recently released OS/2 Warp Server clients for Windows 95 and Windows NT Workstation. The latest release goes a step further by giving Windows NT Workstation clients the option of using OS/2 Warp Server as their server operating system to validate a user's identification and password.

The Primary Logon Client for Windows NT will let Windows NT Workstation users create

IBM, page 65

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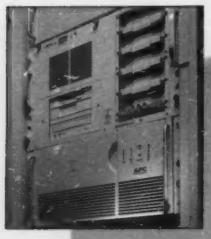

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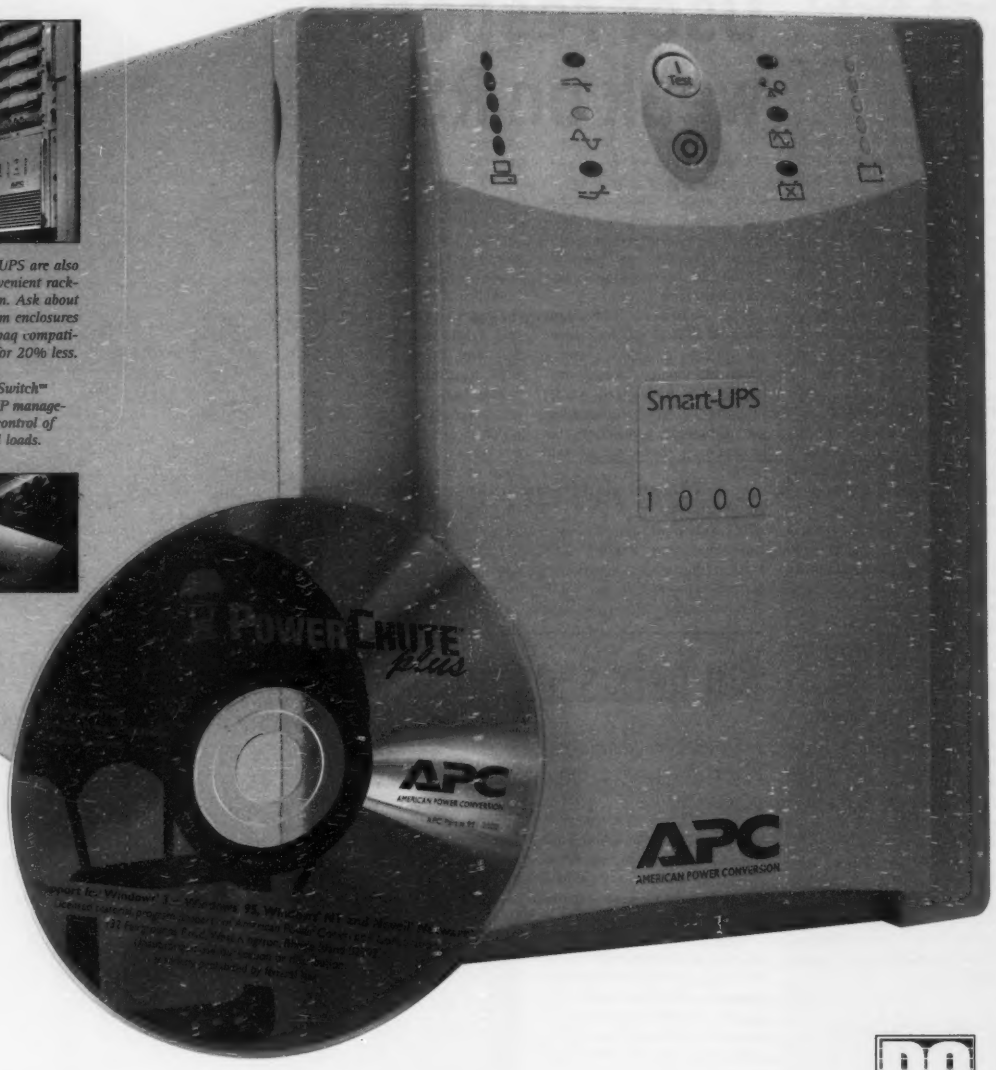

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SPEED DEMONS

Partners in the Iowa trials MCI is conducting include providers of High-Bit-Rate Digital Subscriber Line (HDSL) and Asymmetric Digital Subscriber Line (ADSL) technology

Speeds MCI reported during the trials	
ADSL	
Performance Telecom	7M bit/sec. downstream 640K bit/sec. upstream
Westell Technologies	1.5M bit/sec. downstream 64K bit/sec. upstream
HDSL	
PairGain Technologies	768K bit/sec. both ways
Tut Systems	385K bit/sec. both ways

MCI plans to wire heartland to the 'net

By Kim Girard

MCI COMMUNICATIONS CORP. has announced plans to invade Baby Bell turf by joining with an electric power company and a local telephone company to start wiring rural America with voice, video and high-speed Internet access.

Analysts said the strategy — which will kick off in Iowa in August — will be a boon for corporate telecommuters and open up the untapped rural market for electronic commerce.

"Now companies will be able to reach Ma and Pa Kettle on *Green Acres*," said Jeffrey Kagan, president of Kagan Telecom Associates, a consultancy in Atlanta. "This opens up a whole new world of customers who were previously thought to be lost in cyberspace."

Initially, Washington-based MCI, Northwest Iowa Telephone Co. and Northwest Iowa Power Cooperative, a power utility, will form a joint-venture company called Pioneer Holdings in Sioux City, Iowa.

Local rural distributors that purchase services from Pioneer will have access to MCI's long-distance network. For example, an employee who works remotely could tap in to the power company's fiber-optic ring, which is linked to the local telephone company and then to MCI.

Power companies are key to MCI's strategy because many have fiber-optic networks in place for maintaining and monitoring electrical networks.

Steve Dieringer, vice president of electronic commerce at Banc One Corp. in Columbus, Ohio, questioned whether rural America is prepared to do online banking, particularly using the high-speed Internet services MCI is promising down the road.

Banc One will test its online banking program for consumers and businesses next month. The site will be geared for users with 14.4K and 28.8K bit/sec. modems, Dieringer said.

"We haven't yet seen compelling cases for high-bandwidth applications," he said. "Bandwidth doesn't much matter with banking."

But Daniel Briere, president of TeleChoice, Inc., a Verona, N.J.-based consultancy, said Internet access will help bring electronic commerce to the masses, thus enabling companies such as L. L. Bean, Inc. and Sears, Roebuck and Co. to reach a new customer base. □

56K group to meet in April

▸ *Modems are shipping; standard could take up to a year*

By Mindy Blodgett

THE OPEN56K FORUM, a group of vendors that have banded together to settle the standards issue clouding recent 56K bit/sec. modem releases, plans to meet for the first time in April.

A standards battle has arisen between U.S. Robotics Corp. on one side and Lucent Technologies, Inc., Motorola, Inc. and Rockwell Semiconductor Systems on the other. The companies' 56K bit/sec. modems aren't currently compatible. So far, the standards war isn't slowing users' interest in the new technology, which promises to speed access to the Internet.

WAIT AND SEE

But some Internet service providers are waiting until the standards issue is settled. For example, a spokesman for BBN Planet in Cambridge, Mass., said BBN is testing the new modems but has no plans to deploy the technology until the standards issue shakes out.

"We just think it's best to hang back until these issues are resolved," said Vaughn Haring, the BBN spokesman.

Trials of the new modems are under way across the country. John Brovitz, a spokesman for Epock Network, Inc. in Irvine, Calif., an Internet provider, said Epock is testing Motorola's 56K bit/sec. modems.

U.S. Robotics has lined up several Internet-providers to use its 56K bit/sec. technology.

"So far, we're pretty happy with what we see," Brovitz said.

A spokesman for the Open56K Forum said the group hopes to have its first meeting April 23 in New York. U.S. Robotics hasn't joined the forum, but several companies, including Compaq Computer Corp. and Hewlett-Packard Co., have signed up. U.S. Robotics is sending representatives to the meeting, the forum's spokesman said.

Industry analysts said they doubt that the Telecommunications Industry Association, the organization that will set the standards, will decide on standards by June as planned.

"If you look at history and how long these things can take, I just think it may be a year or more," said Kieran Taylor, an analyst at TeleChoice, Inc. in Verona, N.J.

Vendors are slowly putting products with the new technology on the shelves. The only vendors that have shipped modems are U.S. Robotics — which announced plans to merge with remote access giant 3Com Corp. in Santa Clara, Calif., earlier this month — Hayes Microcomputer Corp. and Diamond Multimedia Systems, Inc.

But industry analysts said it is too soon to gauge the market.

"Products have only been on the shelves for a couple of weeks," said Lisa Pelgrim, an analyst at Dataquest in San Jose, Calif. She said she believes that users will hold off purchasing the new modems because of the standards battle. But purchases of 34K bit/sec. modems will be slowed as users wait for a viable faster alternative, she said.

Although some products are on the shelves, some glitches have appeared in the process. Rockwell, which hoped to blunt the effect of U.S. Robotics reaching market first, announced two weeks ago that it was delaying shipment of its 56K bit/sec. modem chip sets because of software glitches. That affected vendors such as Motorola, which had hoped to start shipping modems with Rockwell's technology.

Rockwell and Motorola officials said they hoped to ship modems by this week. □

Software scans Exchange E-mail

By Sharon Machlis

TREND MICRO, INC. in Cupertino, Calif., has shipped software that screens for viruses in electronic-mail attachments on Microsoft Exchange servers before files are sent to end users.

VIRUS PROTECTION

Systems administrators said such capabilities could cut down staff support time needed to deal with infections after they hit users' desktops.

"We would spend five to six man-hours per week on average" dealing with macro viruses, said Timothy Torres, director of business computing services at San Jose State College of Business in California. In one case, a staffer was busy for three days tracking down a virus that someone had inadvertently sent throughout a department — despite the presence of desktop virus screening.

ScanMail for Microsoft Exchange caught several infected files before they were spread, Torres said. "It solved one of the bigger time-wasters," although viruses can still come in by other means, such as floppy disks, he said.

At Pacific Gas & Electric Co. (PG&E) in San Francisco, beta-user Ed Crowley said ScanMail found several infected files, but it can't clean some viruses automatically.

He said he hopes a future version of the software will be able to remove viruses that can be easily dealt with and pass through other infected attachments to users with a warning that they contain a virus. The current version can either delete infected attachments or move them to a separate directory if they can't be cleaned automatically, said Crowley, a product manager in charge of E-mail at PG&E. Such a directory would quickly fill up with hundreds of files, requiring staff attention.

The software costs $695 for 25 users. A trial version is available at www.antivirus.com. □

SHORT

Monitor from single console

Boole & Babbage, Inc. in San Jose, Calif., and BMC Software, Inc. in Houston recently announced plans to integrate their management software so managers can analyze the performance of complex business functions from a single console. Boole & Babbage will resell BMC Software's Patrol tools, which monitor applications, databases, middleware and servers. A new interface option will let those tools report to Command/Post, Boole & Babbage's central system for consolidating and correlating events that occur throughout a distributed network.

IBM expands OS/2 Warp client support

CONTINUED FROM PAGE 61

peer-to-peer connections to an OS/2 Warp Server network. That will let users access OS/2 servers without changing their Windows interface or learning OS/2 commands.

The Enhanced Remote Access Server for OS/2 Warp Server will let clients that support Point-to-Point Protocol remote access connections — including Windows NT Workstation, Windows 95 and IBM 8235 front-end processor users — remotely access an OS/2 Warp Server as if they were locally attached.

"My first reaction was 'hallelujah'," said David Knight, manager of client/server technical services at Trustmark National Bank in Jackson, Miss. Knight said he needs the Windows NT Primary Logon to support his NT users and help justify to his bosses sticking with OS/2.

"The Windows NT bigots are very vocal," he said. "By broadening the client base that OS/2 Warp Server can support and adding more connectivity options, IBM is giving me ammunition to silence a lot of the opposition I'm encountering about keeping OS/2 Warp Server."

Knight said he prefers OS/2 Warp Server to Windows NT Server because it requires fewer network administrators.

"My first reaction was 'hallelujah.' " – David Knight, Trustmark

"We now have 150 OS/2 Warp Servers, double the number we had two years ago. And yet we haven't had to increase our administrative staff as we've added servers," he said.

Clients also save time and money by not having to teach users OS/2 commands, said Rudy Hartmann, president of Rock Technology Marketing, Inc. in Lakewood, Calif., an independent distributor of electronic components. "We get the best of both worlds — Windows NT Workstation on the desktop, attached to a Warp Server," he said.

Hartmann said he would prefer to stick with OS/2 Warp Server because it outperforms Windows NT Server "hands down," installs easier, has better print facilities and lets users share modems. But Hartmann said he is worried that IBM has lost too much mind share to Microsoft to be a viable option outside vertical markets in which it is popular.

"When I say 'Warp Server' to my colleagues, they look at me like I'm crazy," Hartmann said.

The Primary Logon for Windows NT and the Enhanced Remote Access Server beta software are available for free at IBM's World Wide Web site. IBM plans to bundle them directly into the next major release of OS/2 Warp Server, due next year, the company said. □

User response weak on RSVP

CONTINUED FROM PAGE 61

voice, data and video traffic. Its ability to guarantee the quality of service for networked applications lets IS managers perform many of the same tasks as RSVP, analysts said. And ATM products with quality-of-service guarantees are available now.

That appeals to Pollack, who said he is planning for a new wave of World Wide Web technology that will create collaborative real-time applications such as videoconferencing, whiteboarding, broadcasting and telephony.

ATM TRUMPS RSVP

"[RSVP] is a great idea, but if you go with ATM, you don't need it anymore," said John Woods, chairman of the board at Novi Global Investments, Inc. in Oklahoma City. "A reservation is a sound approach if there's not enough room at an inn, but if there's plenty of rooms available, why would you need [a reservation]? That's the case with ATM, where you have huge pipes."

Novi plans a high-speed wide-area network based on ATM switching to avoid bandwidth-congestion problems, he said.

But Pollack said RSVP could be an important way for users to preserve their investments in packet-based networks without completely overhauling them to overcome bandwidth and latency limitations.

Peter Madams, vice president of software at PictureTalk, Inc. in Pleasanton, Calif., agreed. "Support for live communications in IP networks is almost nonexistent today," Madams said. "It's a component that's missing in IP networks, and it's been a long time coming."

But Madams isn't holding his breath for RSVP.

"RSVP is wonderful. We support it wholeheartedly — and ignore it because it will be a long time before there's a large enough installed base of routers with it for us to make use of its capabilities," he said. □

Fail-safe IP addressing sought

CONTINUED FROM PAGE 61

and Quadritek Systems, Inc. in Malvern, Pa., according to Bain. American Internet Corp. (AIC) in Bedford, Mass., introduced its product last week.

And internetworking vendors are working to improve IP addressing functions through their products, just as software vendors make the functions of DNS and DHCP more automatic, Bain said. The move is on to rebuild DNS and DHCP, he said, with new players set to launch addressing tools this year. Network operating system and internetworking vendors also are working to improve IP addressing functions through their products, Bain said.

"IP addressing is not a one-time issue. You must design, deploy and maintain address control over and over as the company changes." – Tom Bain, Meta Group

"We don't want administrators responsible for assigning and reclaiming addresses, but we need different servers to do this," said Michael Lewis, senior engineer for network evaluation at Chevron Information Technology Co. in San Ramon, Calif.

The DHCP server from Microsoft Corp. handles small sites fine, Lewis said, "but we run into problems at sites with thousands of nodes." Administrators at large sites complain that the interface is awkward and that the DHCP server can't cope well with fragmented blocks of available addresses, Lewis said.

Even worse, according to Lewis, Microsoft's servers "still don't detect duplicate addresses automatically, so we have to hunt them down manually."

Lewis is testing Network Registrar, AIC's second-generation addressing software, as a replacement at large sites. It integrates DHCP and DNS functions through a common database and management interface to coordinate the two functions.

By updating DNS automatically with addresses, Network Registrar helps users find personal Web servers by name instead of by a dynamically assigned IP address, for example, Lewis said.

The cost of Network Registrar is $50,000 for unlimited use of its servers, plus $2 to $5 per node. It runs only on Windows NT, but AIC is testing support for Sun Microsystems, Inc.'s Solaris.

Quadritek recently enhanced QIP, its product for Windows NT servers, with similar dynamic address coordination. Quadritek has also designed redundancy and fault tolerance into QIP in an attempt to eliminate single points of failure that can disrupt address assignment and user access.

"IP addressing is not a one-time issue," Bain said. "You must design, deploy and maintain address control over and over as the company changes." □

COMPUTERWORLD
For links to RSVP resources, point your browser at www.computerworld.com/links/97033rsvplinks.html

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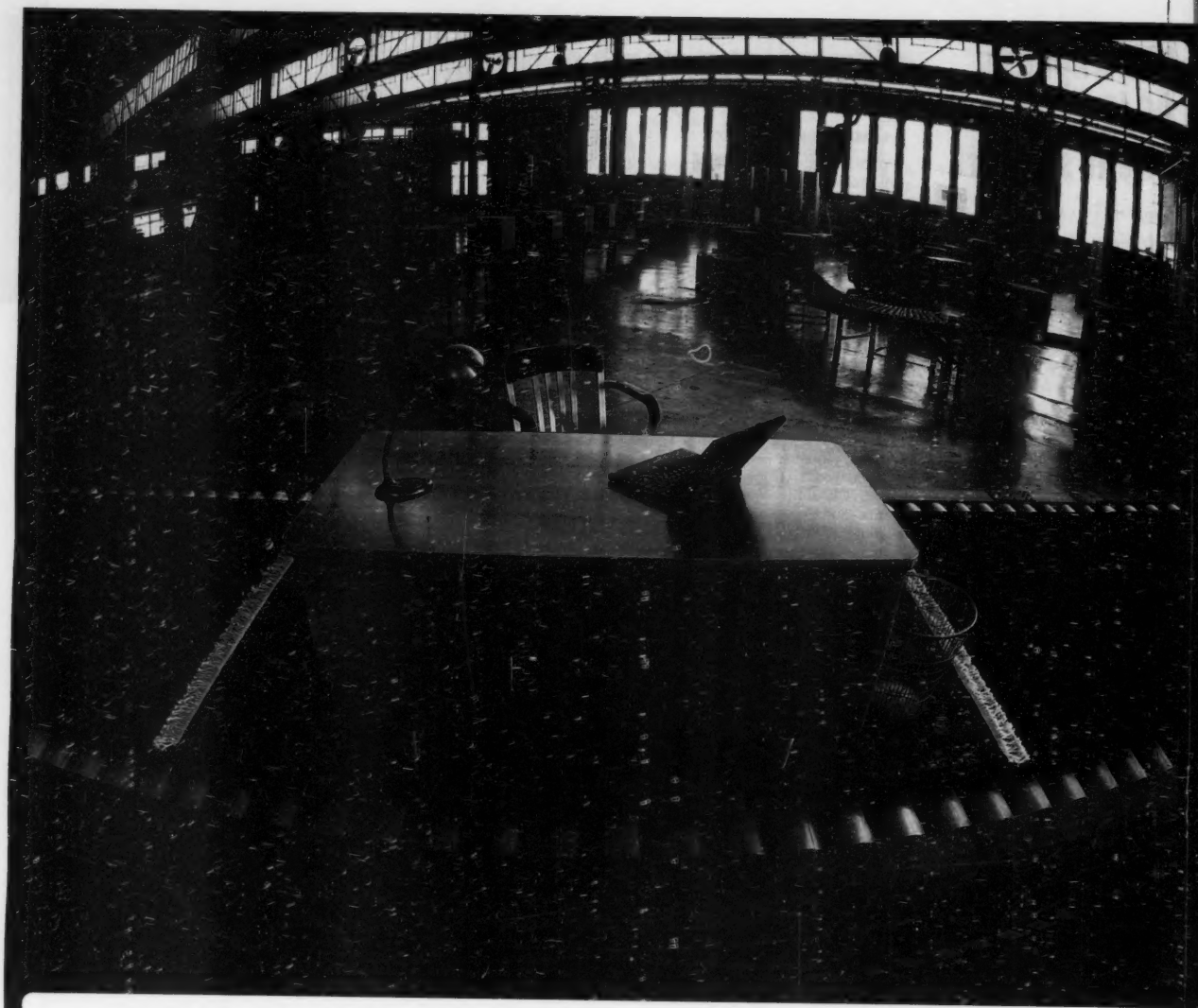

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The Internet

The World Wide Web • Intranets • Online Services

Briefs

Web site costs

JAMES KACEMAN

Companies spend an average of $109,000 to set up and maintain a World Wide Web site for one year. More than half of those costs are devoted to developing the initial content for the site, according to Creative Networks, Inc., a consulting firm in Palo Alto, Calif.

False security

With all the worry about rogue applets and browser holes, some truly security-conscious information systems managers believe that to surf the Internet safely, users should turn to the text-based Unix browser, Lynx. Now comes word that if a system that runs Lynx connects to another machine through Port 19 on the server, a service called "Chargen" could crash the user's computer. Chargen generates a continuous character stream and is commonly run on Port 19.

"I tested 'Telnet 19' on a Linux box here. Boom," said Gary McGraw, co-author of *Java Security: Hostile Applets, Holes and Antidotes.*

Netscape Communications Corp.'s Navigator browser doesn't allow access to Port 19, but Microsoft Corp.'s Internet Explorer could be affected if it connected to a uniform resource locator such as localhost:19.

SAP Web workflow

SAP AG has rolled out its Web-enabled workflow system for its flagship R/3 software application system. The system was designed to let users initiate workflow processes through a Web browser or custom application. A remote salesperson can use the system to send orders electronically and route them to the appropriate departments to make sure inventory, finance and distribution processes are met. It is available now with R/3 Version 3.1.

Pace of Web software scraps test rules

▶ *Quick releases require shorter tests*

By Justin Hibbard

AFTER A THOROUGH evaluation of intranet software last September, Alan Boehme was ready to recommend that his company buy Netscape Communications Corp. products.

But before the company could cut a check, Lotus Development Corp. announced it would rebuild its Lotus Notes groupware on Internet standards. Within weeks, Netscape responded by announcing its products would sport new features clearly designed to compete with Notes. Boehme, director of customer access and logistics at DHL Worldwide Express in Redwood City, Calif., headed back to the drawing board.

The experience prompted him to revamp the way his department evaluates software, a measure other information systems managers said they have taken to keep up with the rapid pace of Internet and intranet software releases. Rather than test one product in a lab for three months, many IS departments pilot-test software as soon as it is available or conduct several tests simultaneously, managers said.

CHANGE IN PROTOCOL

"Having [testing] procedures to deal with just slows you down even more," said Burke Autrey, director of IS at video rental company SuperComm, Inc. in Dallas. "The days of full-scale evaluations are just going the way of the past."

Technology managers must change their way of thinking, Autrey said. Instead of scrutinizing software for several months before rolling it out, IS

Evaluation, page 70

REID HOFFMAN

Burke Autrey, director of IS at SuperComm, says testing procedures slow things down, making it impossible to keep up with all the developments that affect an intranet strategy

Want security? See what hacker does with a cookie

By Sharon Machlis
ORLANDO, FLA.

INFORMATION IN the browser "cookie" files that get Internet privacy advocates up in arms also can threaten World Wide Web site security if administrators aren't careful about using them.

Web servers insert information in cookie files on users' hard drives to help identify them when they return to a site.

At one financial institution's site, simply editing cookie data by changing the identification number gave Bellcore security consultants easy access to another user's account and credit-card data, said Ed Skoudis, a senior systems engineer at Bellcore in Red Bank, N.J. Make sure cookie data left on users' systems is encrypted, he told attendees at the Information Systems Security Association's annual meeting here last month.

That is just the latest example

SHARON MACHLIS

Bellcore's Ed Skoudis: **"What we are setting up is a world that's very useful for hackers"**

of how the hacker community can exploit the move to desktop systems and the Internet. "What we are setting up is a world that's very useful for hackers," Skoudis said at a session on "Current Trends in Hacker Tools & Techniques."

Brian Sowell, senior IS auditor at Tandy Corp. in Fort Worth, Texas, said he uses information he gathers about hacking techniques to test his company's network security. "I try a lot of things," he said. "I do a lot of it for the same ego trip that the hackers do."

As he works to secure a planned Web site that would let customers track their orders, he has already breached computer security during demonstrations for Tandy executives.

"Their reactions are, 'Wow, it's amazing,'" he said.

ARM YOURSELF

Skoudis described popular attack tools, including the following:

■ RootKit, a Unix software suite that helps hackers get a "back door" into one system by changing the operating system's log-in software, stealing information from other systems on a network with a sniffer and hiding all traces of the breach.

The cover-up is done in part by delivering false results for Unix commands such as "ps" (processes) and "du" (disk utilization) to show system status. Once circulated only among elite hackers, RootKit is now widely distributed on the Internet. One way to check for RootKit activity: Run the commands "ls" and "echo *" and make

Hackers, page 70

INTERNET NAMING

Domain debate threatens interoperability

By Mitch Wagner

IT HAS BEEN THE plot of many adventure stories: The king dies without leaving a clear successor to the throne, and the kingdom is thrown into chaos and civil war.

That is threatening to happen on the Internet. Time is running out on Network Solutions, Inc.'s monopoly on registering most domain names. But no clear successor has emerged, and a variety of proposals are being weighed.

CLOSER LOOK
Domain names

A year from now, the National Science Foundation (NSF) contract that gives Network Solutions control over nonmilitary domain names will expire. U.S. government agencies have ex-

Domain, page 70

Domain-name debate threatens interoperability

CONTINUED FROM PAGE 69

pressed little interest in continuing close oversight of the process.

And the Internet has no process for figuring out what should replace Network Solutions' monopoly.

"There is no clear-cut authority with regard to this issue," said Christopher Clough, a spokesman for Network Solutions. "It is something that is evolving."

Internet experts said they are afraid that if several organizations step in with widely accepted, but competitive, domain-naming schemes, the cohesion of the Internet could be shattered.

That may leave the Internet as a series of islands that can't communicate.

Users of one service provider that uses one domain-name registry, might not be able to communicate with users on another service provider that uses a different domain-name registry.

"I'm concerned about partitioning the Internet into various pseudoprivate networks," said Internet user Steve Dierenger, a marketing vice president at Banc One Corp. in Columbus, Ohio.

He said he is afraid that the Internet's future might look like the past, when users of private networks and online services such as America Online, Inc. and CompuServe Corp. couldn't communicate.

"They've just now gradually started to communicate with the rest of the world. I'd hate to go back on that," he said.

EXPECTING CONFUSION

Carl Leubsdorf, webmaster at Calvert Group in Bethesda, Md., said he is concerned that a proliferation of new hierarchies would confuse users.

Suffixes such as .firm, .store and .web have been proposed to supplement the current .com, .edu, .gov, .org and .net.

"If I want to tell someone my E-mail address, I tell them I'm at carl.leubsdorf@calvertgroup.com, and I don't have to explain that," he said. "But having all these other domains besides .com will make it hard to figure out."

Officials at government agencies — which have supervised the process until now — almost universally said it is a problem that the private sector needs to work out without government intervention.

"We expect that the Internet community would have some mechanism in place to handle domain-name registration beyond the point when our agreement with Network Solutions expires," said Beth Gaston, a spokeswoman for the NSF.

One agency in the NSF — the Office of the Inspector General — recently issued a report recommending that the NSF control the process.

But that view isn't dominant in the agency.

Players in the drama said they are confident the confusion over domain naming will sort itself out.

"There's too much at stake here," said Ira Magaziner, a White House electronic-commerce adviser. "It's in everybody's best interest to maintain interoperability. We've seen what happened in the past when that didn't happen in the computer industry."

But at this point, sources confess that they have no idea how they will maintain interoperability. □

A domain by any other name

Internet users and managers of the infrastructure are trying to choose among a half-dozen proposals for doling out Internet domain names:

- **Network Solutions, which currently controls the process, plans to stay in business and compete with other systems while interoperating with them.**
- **An industry coalition called the Internet Ad Hoc Committee is pushing to add seven domains — .firm, .web and .store, for example — that would be overseen by 28 registrar companies that would compete with one another and with Network Solutions.**
- **Image Online Design, Inc., a San Luis Obispo, Calif., consultancy, sued in February to block implementation of the Ad Hoc Committee's plans, saying the .web hierarchy became its intellectual property last July.**
- **PGP Media, Inc., a New York consultancy, has a scheme for a theoretically infinite number of top-level domains — it is starting with 300 — and is suing Network Solutions to force its directory servers to point to PGP's servers.**
- **Macro Computer Solutions, Inc., an Internet service provider in Chicago, is pushing The Extended Domain Name System. This small software utility could run on Internet servers to allow a theoretically infinite number of top-level domains, all pointing back to a "root" server that the company will run for free.**

An alternative to the current system already exists, however. The Internet supports about 180 regional, geographic top-level domains, one for each nation.

Suffixes such as .ca for Canada and .jp for Japan are popular in those countries.

But expanding use of .us — the top-level domain for the U.S. — could vastly expand the number of domain names available domestically.

— Mitch Wagner

AT A GLANCE

Network Solutions
Herndon, Va.

Employees: 200

Revenue: Sixty percent of revenue at the privately held firm comes from domain-name registration and 40% comes from corporate intranet consulting

Parent company: Wholly owned by $2.2 billion Science Applications International in San Diego which specializes in research and engineering for IS, health care, transportation and the environment

Evaluation

CONTINUED FROM PAGE 69

departments should deploy software in small workgroups as soon as possible, he said.

Of course, simultaneous testing requires more people — a problem the IS department at US West, Inc. solved by enlisting end users to test usability. So far, the system has worked, according to Steve Dendinger, a senior analyst at the Boulder, Colo., company.

"It does shorten the time," he said. "If you try to do technical testing while waiting for the usability testing, you'll extend your time."

The trade-off for such speedy deployments is that low-quality software inevitably winds up on users' desktops, according to Niraj Patel, chief technology officer at GMAC Commercial Mortgage Co. in Horsham, Pa. But that drawback must be balanced against the demands of users who want the newest products on the market, he said.

"Delivery, unfortunately, is becoming more important," he said.

But systems architects who find an early use for a new feature can gain an advantage over the competition, Autrey said.

"You've got to always be looking for new features for evaluation," he said.

And observers such as Deborah Hess, a senior analyst at DataPro Information Services Group in Delran, N.J., warned against the allure of new features.

"Any time you have a new feature, and no one else has done anything with it, you're looking at a beta test," she said. "And you're the one who's going to be beta-testing it." □

Hackers

CONTINUED FROM PAGE 69

sure the responses match.

- Ping O' Death, which can crash several operating systems simply by sending a ping packet larger than 65,507 bytes. Defenses: Some operating system vendors have patches to fix this bug. Administrators can use a firewall to filter out large ping packets.
- Synchronize/start packet (SYN) flooding, which causes a system to lock up by sending numerous SYN packets — which request a TCP network connection — from a false address. The false address must either not exist or must be disabled so the sending system can't acknowledge the SYN request. Some firewalls offer SYN connection managers that prevent this.
- TTYWatcher, an easy-to-use program that lets hackers "with even a small amount of skill hijack Telnet connections. This can defeat the most stringent authorization and encryption," Skoudis said. If the hacker gains root access to a machine via Telnet, the hacker can view or "steal" the Telnet session, kicking off legitimate users and leaving the connection open for days. Administrators should discourage any Telnet connections through a firewall; if they must be held, sessions should originate from single-user machines to reduce potential threats to a network, Skoudis advised.
- Web-site Common Gateway Interface (CGI) scripts that don't properly handle special characters. Some CGI scripts, including a well-known one called "phf" that creates a searchable phone directory, will execute any command after the control characters for a new line or a space are typed in to the Web site form where the CGI script is running. Web administrators should delete any unused CGI scripts from their sites and check those that remain for how they handle special characters. □

NEW PRODUCTS

BLACK & WHITE SOFTWARE has announced Web/Enable, software that extends to the World Wide Web object technology for application development.

According to the Campbell, Calif., company, Web/Enable can create client applications or applets in Java or C++.

It contains OrbixWeb, a Java version of the Common Object Request Broker Architecture.

Web/Enable software costs $3,500.

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DCSi has announced Font F/X, 32-bit, three-dimensional rendering software for developing World Wide Web pages and presentations.

According to the Boulder, Colo., company, Font F/X was designed for novice designers and graphics professionals.

It is OpenGL-based, and all the 3-D graphic files may be exported as .bmp or .gif files for Web page design.

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Briefs

Census in $49M pact

The U.S. Census Bureau has awarded a $49 million, six-year contract to Lockheed Martin Corp. in Bethesda, Md., and Electronic Data Systems Corp. in Plano, Texas, to design and support a data capturing system. The vendors will supply equipment and services for a document imaging system that will capture digital information from completed census forms in 2000.

Intranet budgets rise

Nearly half of 150 large companies surveyed this year said they are reconsidering their entire network infrastructures to accommodate intranet technology, according to a study by Computer Intelligence in La Jolla, Calif. Commissioned by Softbank Forums LP in Foster City, Calif., the study found that more than two-thirds of the companies are increasing their intranet budgets, with 17% spending at least $1 million on an intranet this year. More than one-third said they are willing to invest in intranet technologies before industry standards are set.

Kodak buys Wang unit

Eastman Kodak Co. in Rochester, N.Y., last week finalized its purchase of Billerica, Mass.-based Wang Laboratories, Inc.'s software business. Eastman Software, Inc. will focus on workflow, imaging, document management and storage management software.

How corporate help desks charge internal users for PC support

Don't charge directly	65.2%
A fixed allocation	12.9%
Based on use	4.5%
A fixed fee for support service	3.4%
Based on length of call	1.5%
Fixed-fee service contracts	12.5%

Base: 793 respondents

Source: Help Desk Institute, Colorado Springs

IS opts to share budget control

▸ *Web-driven initiatives may give CIOs an out*

By Thomas Hoffman

MORE THAN HALF of all technology spending is controlled by business units outside the IS department, according to a recent study conducted by Meta Group, Inc.

As recently as a few years ago, the information systems department still controlled how and where most technology dollars were spent. But the surge in distributed computing since the early 1990s and new Internet-based projects have led most organizations to decentralize their IS departments and transfer ownership of new project developments to business unit leaders.

LOOK ON THE BRIGHT SIDE

But even though business units are winning the tug-of-war over IS budgets, that doesn't mean IS departments are being dragged into the mud.

Some chief information officers say they feel like they are being stripped of fiscal control. But others look at it more like they are being unshackled.

"The more enlightened CIOs can't wait to get rid of their budgets fast enough, because they're stuck between a rock and a hard place," said Dale Kutnick, president, research director and CEO of Meta Group in Stamford, Conn.

"CEOs are saying, 'Cut the budgets,' while users are saying, 'Give us more,'" he said.

Driving the shift in technology spending is the boom in front-line intranet, extranet and other World Wide Web-driven initiatives.

> Mobil's shared services approach "works to the goals that all [company departments] have." – Marni Mirowitz, Mobil

Those projects are creating opportunities for IS to work directly with external customers and cut information technology infrastructure costs, said Jerrold Grochow, chief technology officer at American Management Systems, Inc. in Fairfax, Va.

That is helping IS transform from a controller of technology to an "enabler" and coordinator of IT, said Bill Jeffery, vice president of management at A. T. Kearney, a management consulting firm in New York.

That is also how Miley Ainsworth sees it. As director of network computing development at Federal Express Corp., Ainsworth and his 20-developer staff lay out the seed money for "proof-of-concept" Internet and intranet projects for the Memphis package carrier.

For example, once Ainsworth's group develops a working prototype of a human resources intranet, the human resources department pays for development and rollout.

Ainsworth said his group likes this budget methodology. "There's always a challenge [for IS] to prioritize which projects are most important, but this way we're able to make sure the

Budget, page 75

WELFARE REFORM

Texas ropes in chaotic call center

By Kim Girard

EVERYTHING'S BIG in Texas, including IS projects, as the state's Department of Human Services found out when it overhauled its welfare benefits system.

The project, which began in 1995, involved outsourcing a help desk to support the replacement of welfare checks with plastic debit cards.

Many speed bumps later, the system has become a model for the rest of the country. But working with the company that installed the proprietary technology brought Texas officials many unexpected computer systems headaches and chaos within the call center. Many angry welfare recipients were left clamoring for help.

"I had a full head of hair when I started this," said Robert J. Ambrosino, director of the human services department's Lone Star Technology Program.

Ambrosino oversaw a 13-month installation of the country's largest electronic benefits system. It serves nearly 3 mil-

Texas, page 74

Middleware can help pave merger path

▸ *Rail giant uses IBM's MQSeries to meld mission-critical nets*

By Tim Ouellette

WHEN Burlington Northern, Inc. and Santa Fe Pacific Corp. merged their widespread rail lines, they turned to messaging middleware to keep the trains running on time.

The merged company, Burlington Northern Santa Fe Corp. (BNSF), uses IBM's MQSeries middleware to let Burlington's and Santa Fe's respective MVS mainframe transaction systems communicate with each other, while allowing for a smooth transition to one standard computing environment.

NOT WIDESPREAD YET

Use of messaging middleware in the case of mergers isn't widespread yet; the technology has taken hold mostly in financial, banking and insurance sites.

But for companies such as BNSF that are planning or going through a merger, messaging middleware is becoming an option to help retain the existing information systems infrastructures and meld the separate operations without lengthy delays, reprogramming and platform changes, observers said.

"We've seen interest in middleware a lot when mergers come up," said Karen Boucher, an analyst at The Standish Group International, Inc. in Dennis, Mass.

And because companies are worried about the huge IS costs and politics involved with combining mission-critical computer networks, she said, some companies actually begin think-

Middleware, page 74

BNSF is using IBM's MQSeries to exchange about 5 million data messages between the railroad giant's two data centers

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COMPAQ

Has It Changed Your Life Yet?

Middleware aids merger

CONTINUED FROM PAGE 71

ing about middleware during merger planning sessions.

Messaging middleware lets multiple applications on different platforms share data with one another through the use of secure, asynchronous data messages held in queues. In-house developers don't have to write complex communications code for each computing platform.

MONTHS OF SAVINGS

MQSeries saved BNSF months in getting the combined operations up to speed, said Terry Meyer, a systems engineer at the company's headquarters in Fort Worth, Texas. Though each company ran MVS mainframes, they used different transaction systems to handle day-to-day business. The merged entity is standardizing on a system called Transportation Services System.

"If we had to write our own connectivity software ... we would have been doing a lot of extra work ourselves," Meyer said. "It smoothed operations better than we expected."

And they expected a lot.

Even before the merger was in place in late 1995, the railway bought MQSeries to lay the groundwork for a smooth transition. BNSF, with 31,000 miles of track to manage, is using MQSeries to exchange about 5 million data messages between two data centers, one in St. Paul, Minn., and one in Topeka, Kan. And with BNSF planning to close the St. Paul center this fall, MQSeries has allowed operations to continue as functions are slowly moved to Topeka.

Another company in the midst of a merger, CVS Corp. in Woonsocket, R.I., said it plans to use Momentum Software Corp.'s XIPC middleware to ease its integration with Revco D.S., Inc. in Twinsburg, Ohio.

One cost these companies must bear when using middleware such as MQSeries is software to monitor the huge flow of data messages. For example, BNSF uses CommandMQ from Boole & Babbage, Inc. in San Jose, Calif., to monitor and manage the MQSeries network.

"When something quits working and people aren't getting their data messages, the problem could be anywhere in the pipeline between the systems, and MQSeries doesn't have the tools itself to say where the problem is," said Larry McMammon at BNSF's Topeka data center. □

TRACK RECORD

BNSF's combined operation statistics

- 31,000 miles of track
- Railroads in 27 Western states and two Canadian provinces
- 43,000 employees
- 1996 revenue: $8.2 billion

Texas

CONTINUED FROM PAGE 71

lion people who use the plastic debit cards to buy food or clothing from 16,000 retailers hooked up to point-of-sale (POS) terminals.

Ambrosino said the state will save as much as $8 million during the $250 million, seven-year outsourcing contract, which was awarded in 1994 to Transactive Corp. in Austin, Texas.

"This was a massive technological implementation," said Marc Palazzo, a spokesman for Transactive. "With a project this large in scale, inherently, problems will arise."

And so they did.

When the system went online, the front end couldn't handle the dial-up volume of 10 to 12 POS devices calling the host simultaneously, Ambrosino said. A call coming from a retailer would get lost, held or dropped because the communications gateway wasn't set up like a traffic cop to route the volume of incoming toll-free calls.

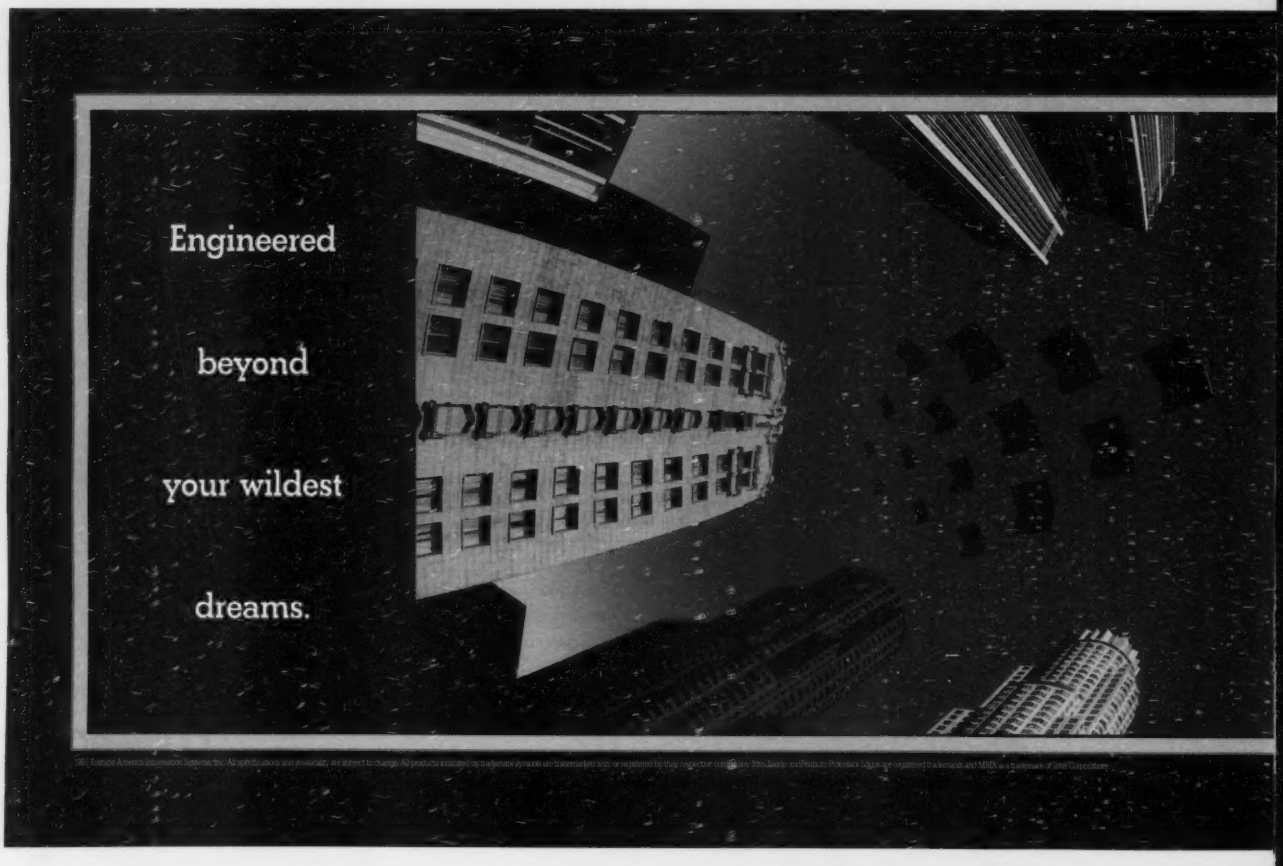
The unprepared call center was swamped by angry users.

"That's when the system came to its knees," Ambrosino said. "It wasn't robust enough. Clients kept calling. Hundreds of thousands of users called. They'd go to use their card, and it wouldn't work."

In the weeks that followed, the help desk went into crisis mode. Help desk employees quit, and overtime skyrocketed. More than 30% of operator-assisted calls were disconnected. The overtime budget exploded, key players on the project were fired or quit, and the federal government demanded improvement, Ambrosino said. The state withheld $6 million from Transactive for three months before both parties worked to clean up the system.

Mike Humphrey, a business director at Public Technology, Inc. in Washington, said states have poor luck outsourcing. Public Technology is a nonprofit technology consultancy to government agencies.

"They control costs, but contractors don't have any magic answers," he said. "They aren't



visionaries.... The contractor is worried about making a profit."

By last March, problem-solving was under way. An automated voice recognition system was installed that will let clients access account balances and other information without having to speak to an attendant. The state also changed its performance expectations; it is using benchmarking tools to manage the call center and monitor its performance. Instead of 100% response to all calls, the state aims for a 90% response rate.

In its original contract, the state didn't spell out penalties for failure to meet call-center service requirements.

Colleen McCormick, an analyst at Gartner Group, Inc. in Stamford, Conn., said Texas isn't alone in failing to define call-center service expectations. "That's something we see fairly often," she said.

Today, both Ambrosino and Transactive officials are pleased with the systems. Transactive is installing similar systems for Illinois and is negotiating contracts with Mississippi and Indiana, Palazzo said. □

IS shares budget control

CONTINUED FROM PAGE 71

projects meet [company] standards," he said.

Other companies also have succeeded in balancing their IT spending models between IS and business units.

Before Wal-Mart Stores, Inc. opened its online shopping center on the Web last July, the retailer's marketing and IS departments decided to split the development and infrastructure costs down the middle, said Brian Hess, Internet marketing manager at the Bentonville, Ark.-based company.

FedEx's Miley Ainsworth: It's always a challenge for IS to prioritize projects

That worked well for both camps, since the marketing group was able to explore a new retail niche, and the IS group "got excited about building the site," Hess said.

He said he expects the company to break even by December on what analysts have described as a multimillion-dollar investment.

Mobil Corp. last year created a "shared services" model whereby 11 business units, including the IS and legal departments, contribute services to client projects.

Six months before department budgets are approved, representatives from the shared services group meet with business unit heads to prioritize projects and determine chargebacks to the shared services group.

This model is helping to simplify the April rollout of an Internet-based electronic data interchange (EDI) system, said Marni Mirowitz, a program coordinator at Mobil in Fairfax, Va.

The EDI system, from Proxicom in McLean, Va., is expected to streamline purchase orders between Mobil and its 300 lubricant distributors, Mirowitz said. Shared services "works to the goals that we all have" at Mobil, said Mirowitz, who expects the Internet EDI system to remove $100,000 from the company's annual value-added network overhead. □

Finite budgets, not infinite service

Dean Meyer is a contrarian on the IS budget control issue; he believes the shift in spending power "is killing CIOs." The problem, he argues, is that end users expect infinite IS services for a fixed price.

IS departments "are inundated with demand for services well beyond the corporation's spending power, and IS ends up getting blamed for unresponsiveness," said Meyer, who is president of N. Dean Meyer and Associates Inc., a Ridgefield, Conn., IS management consulting firm. He offered several suggestions to CIOs, including the following:

- **Use budgeting as a "sales and contracting process," in which IS can help business units understand how much spending power they'll need and the kinds of services they can buy.**
- **Help end users understand how much of their technology dollars are encumbered by maintenance and existing project rollouts. Then help them set priorities for the remaining discretionary funds.**
- **Never defend budgets for client beneficiary activities. Leave that to end users. — Thomas Hoffman**

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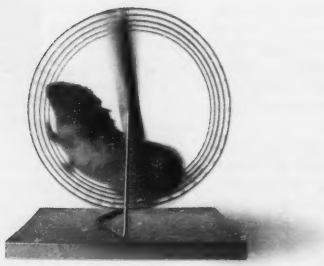

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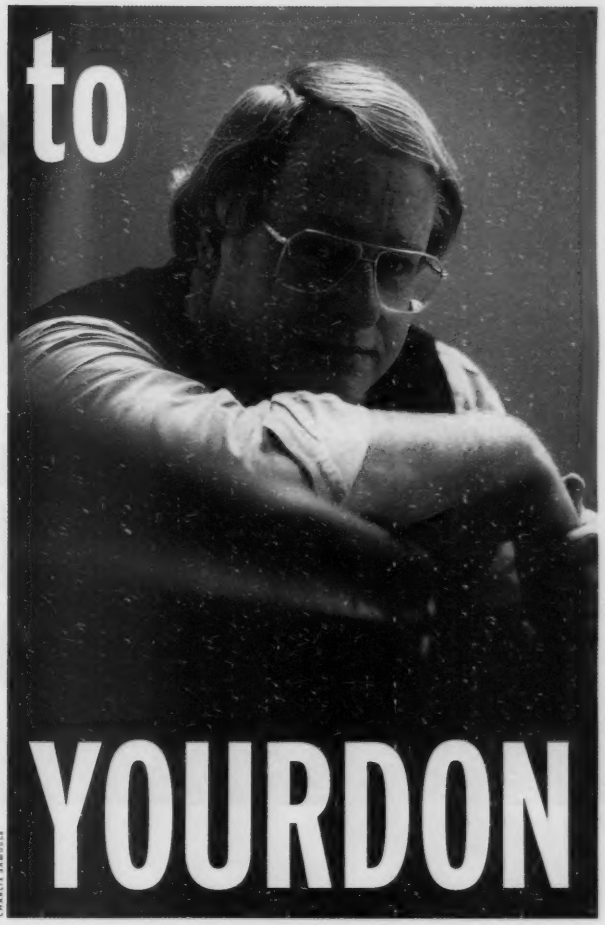
EXT 25

Managing

Excellent adventure?
Experience shows that organizing IS into centers of excellence isn't for everyone. Page 81

Toiling away at the 'project from hell'? Author Ed Yourdon has some advice for you in 'Death March,' his survival guide for 'Mission Impossible' projects

HELL ACCORDING to YOURDON



CHARLIE SAMUELS

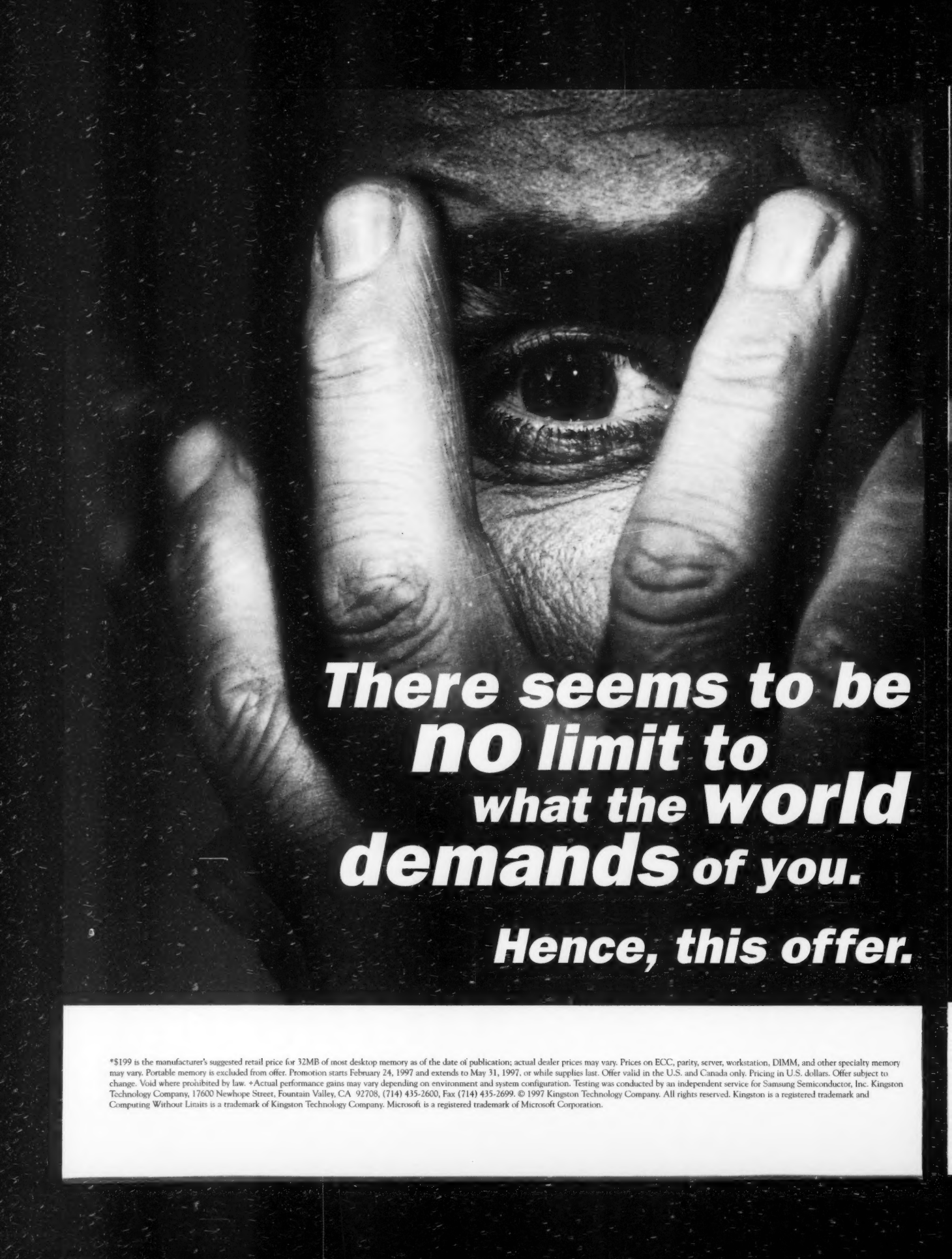
BY KATHLEEN MELYMUKA / YOU KNOW THE DRILL: High-visibility, high-risk, make-or-break project. Killer schedule, skeleton staff, tight budget. Chance of success is less than even. Lives are on hold for the duration — three months, three years, whatever. Work, leisure, sleep, meals, mental and physical health are all subsumed by The Project. Spouse, kid, significant other will have to wait.

The Death March Project is becoming so alarmingly typical that methodology guru Ed Yourdon has written a survival guide.

Death March: Managing Mission Impossible Projects, due this week from Prentice Hall in Upper Saddle River, N.J., takes a long, hard, funny and practical look at this all-too-common reality.

Yourdon recently discussed the book.

Hell, page 80



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HELL

CONTINUED FROM PAGE 77

CW: For whom did you write *Death March*, and why?

YOURDON: I wrote it for software developers and project managers. More and more software development projects seem to fall in this category. It used to be the exception; now it's the norm. It's important to present some questions people ought to be asking themselves before they get sucked in to such a project, and for those who do, how do you survive, manage them and have some chance of success?

CW: You write about four types of death march projects in terms of team member satisfaction and chances of success.

YOURDON: The "Mission Impossible project" has a high chance of success and a high degree of satisfaction. [Team members] think of themselves as very bright, hard-working and smart: "Yes, there are risks but through cleverness and hard work, we'll succeed."

The "ugly project" has a high chance of success but a low degree of satisfaction. The project manager says, "I will make this succeed even if I have to kill everybody on the project team." The feeling is, people with the right stuff can handle it. So his victims have nervous breakdowns, but the project succeeds.

Then there are "kamikaze projects" where everybody knows the project will fail but they all feel good about it: "We gave it everything we could even though it was a lost cause."

In "suicide projects" everyone knows it will fail, and they feel miserable on top of it.

An older guy was describing a project that he was involved in, and everything sounded terrible. He said, "I'm 63. I can't get a job anywhere else. If I can just hang on, I can retire. I've got no alternatives." That was a suicide project.

CW: Are there other factors that make one type of death march even deadlier than another?

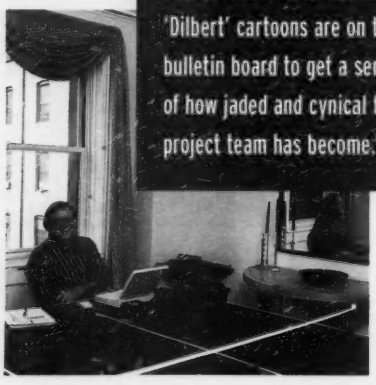
YOURDON: Size and length of the project. If it's a six-month death march, you may decide you have to put up with it because the alternative is unemployment. The really dangerous ones go on two or three years. When you come up for air, you find your family has disappeared, you've ruined your health, and so on.

CW: Is a death march project in and of itself a bad thing?

YOURDON: Not necessarily, and they're not confined to software. You could call the American [moon landing] effort a 10-year death march in the sense that it was 24 hours a day, seven days a week. People burned out, and marriages were ruined. But by God, they put a man on the moon. And for many of the people involved it was the most important event in their lives. So it's not necessarily a bad thing, particularly if it succeeds.

But often you can see on the first day that it's doomed. It's Project Titanic. They know they've left port, and they're not coming back.

How can you tell if a death march project is in trouble? Yourdon says to look for "the Inverse Dilbert Correlation Factor: You look at how many 'Dilbert' cartoons are on the bulletin board to get a sense of how jaded and cynical the project team has become."



CW: What kinds of things should I do if I'm recruited for a death march?

YOURDON: People within an organizational unit get sucked up by the prevailing propaganda. The most important thing is to step back and let the people important to you in your life ask, "Why are you doing this?" Particularly kids, because they have no preconceptions. You can take stock and get a more realistic sense of what you're getting into and consider the alternative of saying, "No. Life is too short."

CW: If there's one word you want readers to take away from the book, it's "triage."

YOURDON: Absolutely. One of the assumptions that many software developers and project teams have had for years is that you have to deliver all the software that fulfills all the requirements for some customer on time and under budget, or you've failed. In a death march, you can virtually guarantee that you can't deliver it all. Unless you carry out a triage in terms of requirements, you're doomed.

You've got to get the customer to identify those requirements that are absolutely crucial, those that are important but could be sacrificed if absolutely necessary, and those that would be nice but are not necessary.

CW: What if no one will budge on his own priorities?

YOURDON: If nobody will budge, you have a very clear, very early indication that this probably will be a suicide mission. Usually, a month before deadline, there will be a showdown where they will have to admit that you will not finish the whole thing in time. You'll have to decide what aspects of functionality you're going to sacrifice.

It's a real tragedy, because you have committed resources and practically finished some functions that will be jettisoned. If you had triaged at the beginning, you could have spent that time working on the [most important] things.

CW: Is the project manager the make-or-break factor in a death march project?

YOURDON: I believe so. The manager fights political battles and has to keep [the team] organized, motivated, focused and buffered from the methodology police and the furniture police and the rest of the bureaucracy.

If the project manager is not willing or is unable to confront problems, then it becomes almost impossible for the team to succeed.

CW: But if he's really good . . .

YOURDON: If you can create the kind of culture that boosts morale and keeps people focused, that can be terrific. Steve Jobs put his [Macintosh] group in a separate building and flew a skull-and-crossbones flag and kept the bureaucracy out. If you can create that kind of Robin Hood culture, that's very important. It can be kind of fun.

CW: Why is the "daily build" so important in death march projects.

YOURDON: It's very common that testing activities occur months, or even years, after the project commences. So during the early stages, no one is really sure how much progress has been made. They can deny reality as long as they're only delivering diagrams and memos. [In] the daily-build approach, at the earliest possible moment you build a version of the software as if you had to deliver it to the customer. The next day you build another version with a little more software and function. Next day, build again and again. That creates an enormous sense of reality. You can't fake it. You can't blow hot air if you have to build it. Windows 95 apparently went through 950 daily builds.

CW: How can you tell if a death march is in deep trouble?

YOURDON: There's the Inverse Dilbert Correlation Factor: You look at how many *Dilbert* cartoons are on the bulletin board to get a sense of how jaded and cynical the project team has become.

CW: What one thing would you advise someone to do to succeed in a death march?

YOURDON: To negotiate the budget and schedule as rationally as possible. You need to negotiate yourselves into the least-miserable conditions you can. If you can't negotiate your way into a halfway possible situation, get out.

CW: What one thing would you advise him or her not to do?

YOURDON: I'm against using silver-bullet methods or tools as a form of salvation. It's dangerous to get in the position where a miracle is supposed to be accomplished by the technology you're using. □

Melymuka is a freelance writer in Duxbury, Mass.

COMPUTERWORLD

Want to hear more from Ed Yourdon? Log on to www.computerworld.com and listen to Kathleen Melymuka's conversation with the author of *Death March*.

STILL AN EXCELLENT ADVENTURE?

Should you organize your IS department into 'centers of excellence?' Beware! Experience shows it isn't for everyone.

In 1994 and 1995, some IS organizations began restructuring into "centers of excellence," ripping up old organizational structures and realigning staff members into teams organized according to their technical expertise.

Rochelle Garner examined the centers of excellence phenomenon in an article, "Your Next Excellent Adventure?" [CW, Sept. 11, 1995]. Now, she revisits the concept.

By Rochelle Garner

Texas Instruments' Steve Lyle on centers of excellence: "It can be painful, but in my view, it's inevitable."

SOMETIMES YOU JUST HAVE TO BITE THE BULLET. And if your company operates in a market with nearly constant upheaval, that bullet could be cast in the form of "centers of excellence."

Don't know the term? Maybe "competency center," "shared resource center" or "high-performance work environment" has a more familiar ring.

Whatever the name, these centers — which function as resource pools that can be tapped as new projects arise — represent a profound change in organizational design and workforce behavior.

Most of the issues surrounding centers of excellence are well-documented. What's less well-known is how the concept can affect companies over several years. Take Texas Instruments, Inc., which has become the centers of excellence poster company since it implemented the practice in 1994. A year ago, TI considered disbanding its brave new organization. The problem was communication.

"Project leaders felt their projects weren't being staffed fast enough by the coaches," says Steve Lyle, director of Business Excellence for Information Technology at TI in Plano, Texas. In some cases, he says, the project leaders were right. But to be fair, the old organization wouldn't have staffed those projects any faster. "We were going for the hot skills, which take time to develop," he says.

GROWING PAINS

But that hasn't dampened Lyle's views of centers of excellence. "Dynamic companies need this kind of consulting model where people go off on a project, come back to their centers when it's finished and either redeploy immediately or go through training for the next project," he says. "It can be painful, but in my view, it's inevitable."

It can be painful because with centers of excellence, everything you know is either wrong or passe. Middle managers can lose their sense of worth; they're no longer masters of those whom they deploy on a project. They may have even lost performance-evaluation duties. Staffers who were respected for their legacy expertise may no longer feel valued.

Forget Cobol or even C++. The hottest skills this month demand Java and Powersoft's PowerBuilder. And if you think you know how to manage your staff, think again. With centers of excellence, the traditional hierarchy disappears. In its place is an organizational model that comprises coaches, project managers and "360-degree" performance evaluations that base compensation on teamwork and the ability to satisfy the customer, not "the boss."

TI officials found that "the heart of the problem really lay with the fact that we were changing the whole belief that the boss should be the one who determines how much people get paid, and what and where they get trained," Lyle says. "We found the single biggest cause of disaster is when you don't dispel middle management's fears."

TI's remedy? As it moves into its next organizational structure — which emphasizes the ability to share knowledge across all of IS — it includes project managers as part of the design.

"The business has benefited because people viewed this structure as investing in them," Lyle says. "And for a while it helped us retain people we might not otherwise have been able to."

But only for a while. And that fact has surprised companies as they enter their second year with a centers of excellence organization. A better-trained workforce is more attractive to outsiders. People leave.

"We began to see increased turnover among people looking outside for advancement opportunities," says Nancy Cavanaugh. Until November, she was director of centers of excellence at Bell Atlantic Corp.'s Large Business and Information Services division in Arlington, Va. In fact, Bell Atlantic's turnover became noteworthy: It jumped from less than 3% at the beginning of 1996 to 6.4% at the end of the year.

"The first reaction is, this kind of turnover is negative," Cavanaugh says. "But I think it's healthy to have people move in and out. Besides, these numbers are more in sync with the industry. I think ours had been artificially low as a function of the [telecommunications] monopoly."

The challenge for companies? To devise incentives, preferably before turnover becomes an issue, that will convince the newly trained staff to stay. That means bonuses based on finishing ahead of schedule and even stock options. "In the competitive market for skilled staff, companies have to be ahead of the game in thinking about keeping highly qualified people," Lyle says. "That's a big lesson we've learned."

The moral? These centers of excellence can turn out to be even tougher than everyone thinks. And as time progresses, companies need to realize that middle managers aren't expendable and that highly trained staff doesn't come cheap. If that bullet seems too hard to bite, don't step in to the line of fire. □

Garner is a freelance writer in San Carlos, Calif.

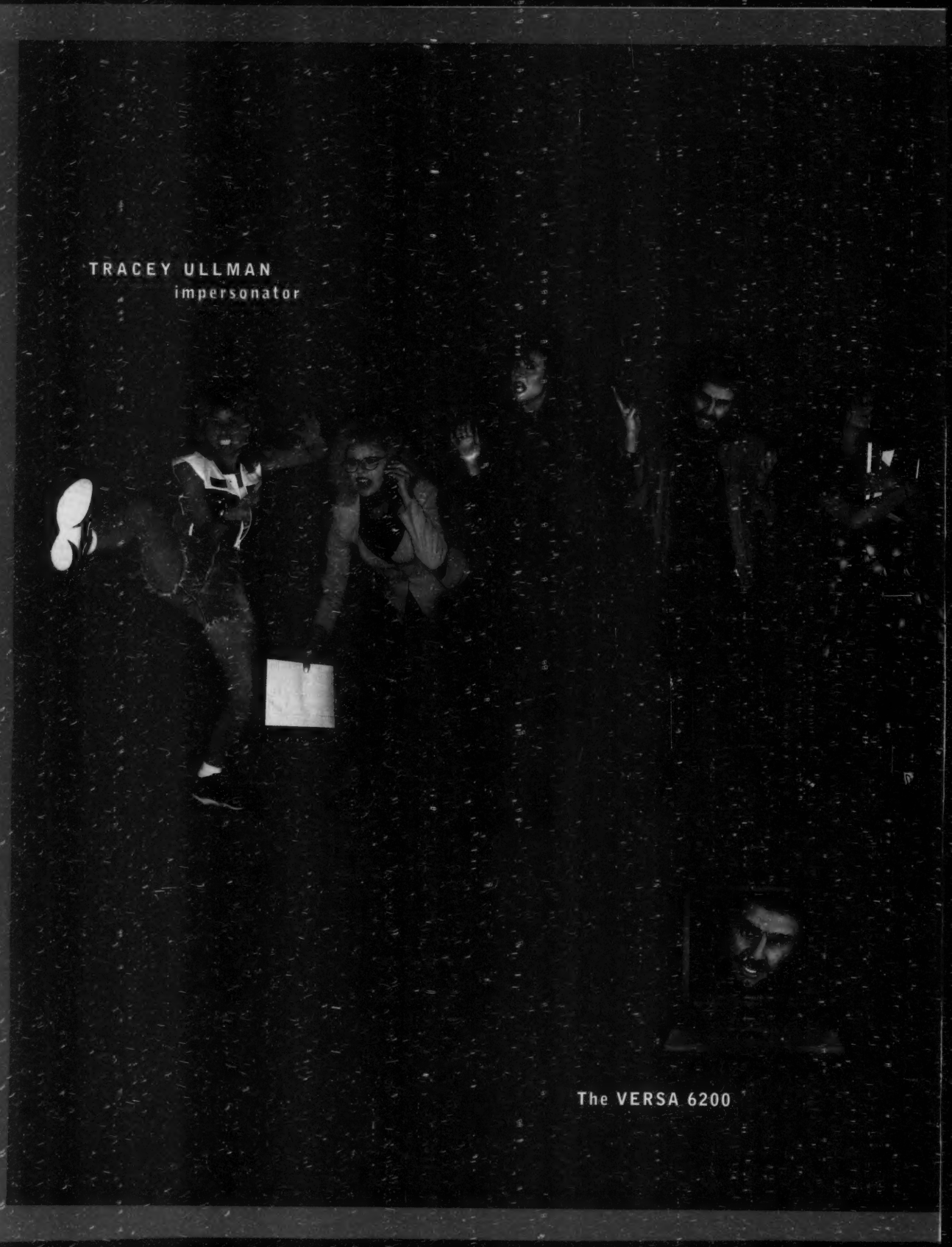
Insights on excellence

In 1996, Nancy Cavanaugh co-wrote a paper that detailed Bell Atlantic's experiences with centers of excellence. The paper won an award from the Society for Information Management. It offers valuable insights for companies that are thinking about adopting this high-performance work practice. It is on the Web at:

www.simnet.org/public/programs/capital/97paper/paper2/2.html

Cavanaugh's paper makes the following suggestions:

- Transform the entire organization, not just parts of it.
- Be prepared to manage staff anxieties.
- Nurture an environment that values teams and diversity.
- Develop formal communication mechanisms across new management roles.
- Devise new forms of incentives that are in line with customer satisfaction.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JIM CHAMPY

SOME NEW TRICKS – EVEN FOR 'OLD DOGS'

Recently I've been struck by how the notion of "leadership" in the IT industry has been challenged by the almost-organic growth of the World Wide Web and related intranet technologies, and by how it is redefining leadership in the IS profession.

What's at work is the principle that collaboration, rather than control, is rewarded. Witness Netscape Communications Corp., which gave away free copies of its Web browser and plans to feature Marimba, Inc.'s Castanet information "push" product in a future release. Yet, even as we watch the final triumph of open systems over the old model of proprietary advantage, there seems to be a lingering desire for the good old stable architectures of yore.

Listen to the lament of an "old" IT manager friend of mine — barely in his 50s — who is contemplating retirement. A self-described "old dog," he began his career punching cards and plans to end it as the head of a 2,000-person IT department.

"Life used to be easy," he reminisces. "I remember when this industry, and to some degree my profession, was defined by IBM. We depended so much on that company that we gave the IBM account rep and his [systems engineers] office space down the hall. Now there is no obvious industry leader, no single company that defines the future. We have to figure it out ourselves." Then he adds, rather philosophically, "I'm not sure I would succeed if I were starting out today."

On one level, he's right. Today, there isn't a company that defines this industry — one that roughly includes information management, computing and communications. If there is any leadership present, it comes from Intel and Microsoft. And although both would like to control the "industry," they represent only a segment — indeed, a segment being challenged by a vision of network clients. But with this newfound freedom comes uncertainty for the IT professional. Nobody is telling you what to do, which can be intimidating.

Hardware manufacturers, software publishers, network providers and service companies all argue that each has the total solution. The truth is that no single one of them does and that the IT professional will be faced with hard decisions in a fragmented, fast-moving industry. In fact, the evidence points to a rapidly evolving Internet computing model in which users will access remote servers directly to get just the information they want. The closest thing to this now is PointCast, a proprietary news-retrieval engine that will have to change as the Web turns inside out, from a "pull" to a "push/pull" architecture. On the positive side, there are tremendous opportunities to create value in such areas as electronic commerce, knowledge management and customer databases.

I guess what it all boils down to is attitude. For some, there is a pony under the mound of apparent difficulties. For others, like my "old dog" friend, the future may be like the self-fulfilling epitaph on a pessimist's tombstone: "I expected this."

The traits that will reward tomorrow's IT professionals — whether new or old dogs — are openness, sensing ability and integration skills. Let's take them in order:

- In some ways, all management today begins with openness. The truth about what's going on can't be gleaned from closing yourself off or quickly adopting hard positions.
- There's also an overwhelming need for the second critical skill: sensing. When an industry is in flux, having a sense of where things might go will separate the high performers from the also-rans. And this applies not only to where the IT industry will go, but also to the industries in which your business operates.
- To strengthen your sensing skills, you might try "walking" in your markets — with your customers, that is — to feel what's going on. You can read all the research reports you'd like, but it's your own sensing ability that will give you confidence that you've made the right decision. Maybe a little dose of paranoia wouldn't hurt either. Try to discern what customers really need and how competitors could do what you're doing now cheaper, faster and better.
- Finally, knowing how to put things together will become increasingly important. And I don't mean just plugging one device in to another. That should become easier. What's tougher is putting people and organizations together. Solving the future's technology problems will take the knowledge and skills seldom found in one person or place. Again, the guiding principle will be collaboration. Knowing how to integrate people and companies with different ideas and cultures will become a premium skill.

So for IT professionals, leadership has actually been handed to you. Freedom to choose may be scary. But it's essential to controlling your own destiny. □

Champy is chairman of consulting at Perot Systems Corp. in Cambridge, Mass. His Internet address is JimChampy@ps.net. His newspaper columns are syndicated by Tribune Media Services.

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Study: Health care slow to adopt 'net

The health care industry may be relying more on information and knowledge management than ever before, but security concerns are causing it to embrace Internet technologies more slowly than other industries, a recent Ernst & Young study says.

According to the study, access to information will be critical as the industry shifts from fee-for-service to managed care. But only 52% of respondents indicated that the Internet will be a top priority for them in the next three years, and one-third of the respondents expressed no interest in boosting their 'net use. Also, six out of 10 respondents don't have articulated Internet usage strategies in place.

The study of 805 organizations by Ernst & Young in New York, "The Role of the Internet in Health Care: Current State," covers a wide range of health care functions. It found that nine out of 10 respondents cited security issues as the major reason they haven't moved to the Internet.

That doesn't shock Edward Bianco, chief information officer at Lowell General Hospital in Lowell, Mass. But he says the Internet is becoming more secure.

Daniel Moffatt, CIO at St. Joseph Health Center in Kansas City, Mo., agrees. He says the Internet has become much more secure during the last year and blames media hype about the issue.

Comparatively, he says, "We're more than comfortable handing our credit card to a waiter and having him disappear for 15 minutes." The security issues are preventing the industry from "realizing potentially huge monetary and scientific gains by applying Internet technology," said Daniel Nutkis, chairman of the study and CEO of ConnectedHealth.Net, an Ernst & Young subsidiary that specializes in IT for the health care industry.

The study says Internet technologies provide immediate tangible value for health care institutions. It cited two examples: Aetna/U.S. Healthcare, in Hartford, Conn., uses an Internet-based service that lets members change their primary care providers online, which cuts labor costs. And an intranet at the University of Kentucky Chandler Medical Center in Lexington gives emergency-room staff quick access to medical histories, outpatient data and physician on-call information.

Lowell General plans to Web-enable its applications, Bianco says. The hospital's World Wide Web site includes interactive heart tests, electronic-mail links to doctors for medical queries and SurgeryCam, which provides a surgeon's-eye view of a surgical procedure. Lowell's intranet has been up for a year, Bianco says.

The question about the Internet, Bianco says, is: "How do you embrace it and how do use it?" Many hospitals "are really embedded in the old ways of doing business," he says, and they have to ask themselves how they will share information with other health care organizations amid a climate of mergers and managed care. — Rick Saia

Buyer's Guide

USER VIEW: Homegrown solutions to the year 2000 problem are popular but controversial, and those users who have bought off-the-shelf tools would like a bit more intelligence in them.

By Cathleen A. Gagne

"THIS ISN'T A SPRINT ... IT'S A YEAR 2000 MARATHON"

WAIT! DON'T TURN THE PAGE. This isn't just another year 2000 article. Twenty-three of your peers donated the contents of this feature through in-depth interviews with Market Data Group in Framingham, Mass. They want to tell you where they're at in their year 2000 processes and how some of the many year 2000-related software tools are working. They want to share advice with you. They've been there, done that (or, at least, are doing it).

The biggest findings in our survey are that hardly anyone is worried about succeeding in the year 2000 marathon, and a surprising number of information systems shops are using homegrown year 2000 tools rather than off-the-shelf products. These findings run counter to analysts' conventional wisdom.

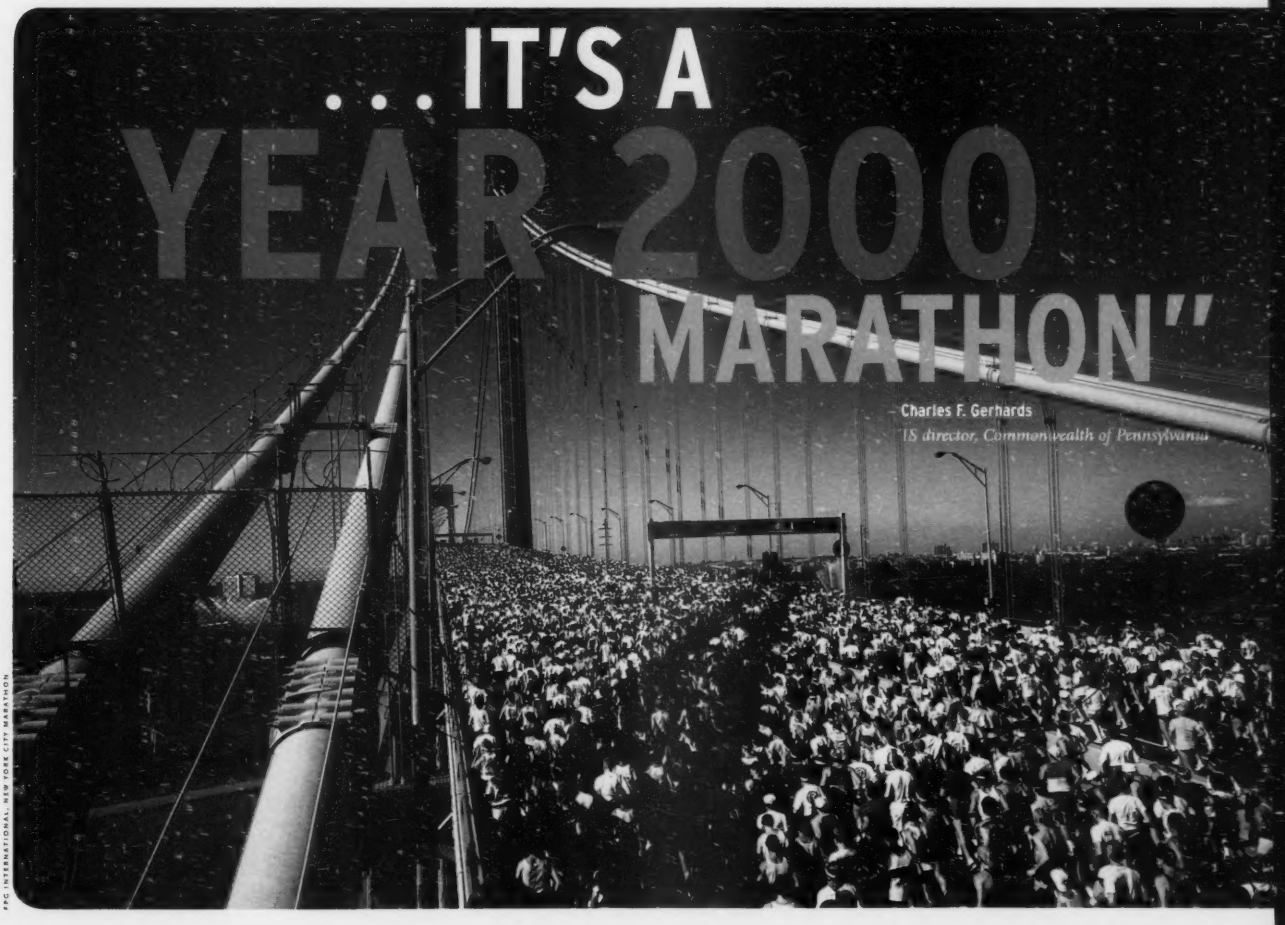
Out of 23 managers surveyed, 17 say they are *not* worried about meeting their year 2000 deadline. "Publicity concerning the year 2000 issue indicates that somewhere under the water lies the Loch Ness monster," says Doug Little, director of software development support at Enterprise Rent-A-Car in St. Louis. "Some companies may be faced with disaster, but we think our approach will guide us past the major pitfalls."

BUT ANALYSTS WE SPOKE WITH WERE LESS OPTIMISTIC

"These same people who express confidence, many of them are in very early stages of addressing the problem, trying to discover the size of it, doing pilot projects and so forth," says Dick Heiman, an analyst at International Data Corp. in Framingham. "Until they get a little further into the problem, they won't fully understand the scope of the effort that's required."

"People are going to push the panic button the fourth quarter of this year or the first quarter of next year," says Michael

Year 2000 marathon, page 88



PPG INTERNATIONAL NEW YORK CITY MARATHON

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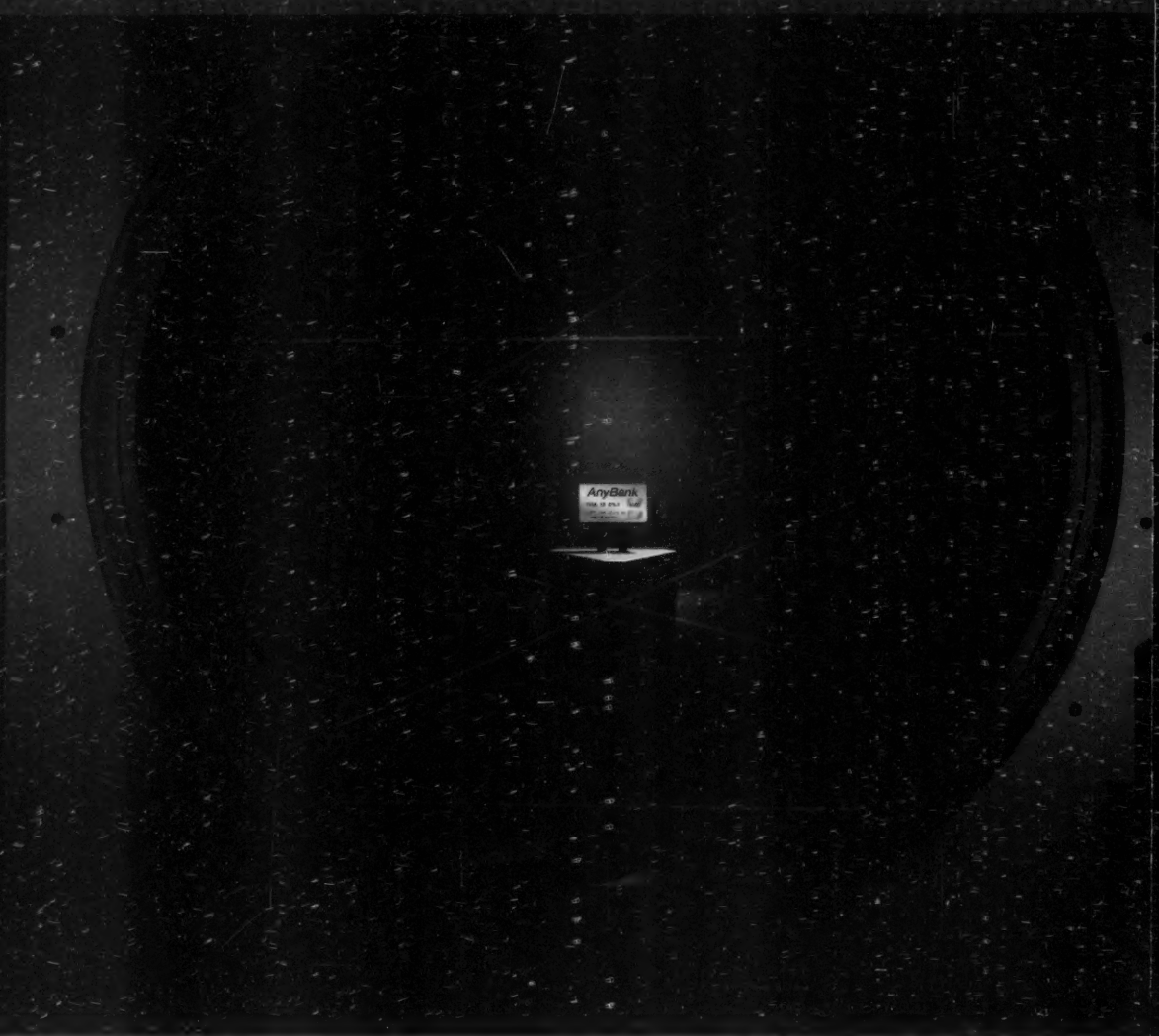

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VOICES OF EXPERIENCE

Here's what your peers advise as you begin — or get deeper into — the year 2000 conversion process:

"As a first step, try to take a snapshot of the situation on an overall basis. Don't get bogged down in the details trying to analyze each system in extreme detail. Do a broad-stroke analysis in the beginning to get an idea of just how big the problem is. . . . You can drill down in the code later on."

JACK SAMARIAS
Vice president, technology services
National Association of Securities Dealers
Rockville, Md.

"If you have developed a system to do a specific part of your business, is that part of your business still relevant? If not, forget about the system. There's no point in analyzing if you can re-engineer the business function to eliminate that system."

LES MUSE
Director, information systems office
New York State Office of Mental Health
Albany, N.Y.

"If you have enough lead time, convert stand-alone systems and learn from the process before you attempt mission-critical applications."

JOHN FROHLICH
Director of emerging technologies
Blue Cross/Blue Shield of Ohio
Beachwood, Ohio

"Stay away from tools that are strictly year 2000. We want to make sure we don't just bring in a year 2000 tool to convert. We want the application teams to be able to use those tools going forward. Thus, vendors come in and actually mentor the application team on how to use the tools."

SYLVIA ZBOROWSKI
Senior manager, year 2000 solutions
MCI Communications Corp.
Atlanta

"Treat this as a strategic business project. If you treat it simply as a technical project, you will increase risk."

IRENE DEC
Year 2000 program director
Prudential Insurance Company of America
Roseland, N.J.

CONTINUED FROM PAGE 85

O'Connell, a research analyst at Gartner Group, Inc. in Stamford, Conn. People will have just finished their detailed analyses and will really understand how complex the problem is. Then they'll realize that they have no resources to fix the problem.

The other six respondents say their biggest fear is that business partners and vendors won't stay on top of year 2000 compliance. And that's something companies should be worried about, O'Connell says.

"If you're worried about your business partners, then to me that's an indication that you don't have the problem under control," says Leland Freeman, managing director of year 2000 services at Management Support Technology Corp. in Framingham. "It's an enterprise issue, so an internal technical solution is not enough. The solution has to embrace your external relationships."

The second-biggest trend drawn from the surveys: Lots of your peers are using homegrown solutions because they lack confidence in vendors' tools. Again, we did a reality check with some analysts. They say if you roll your own, you'll be sorry (page 93).

While on the subject of tools, we thought you'd like to find out about the commercial tools people are using. Page 93 has a roundup of tools and comments from your peers who are using them.

And below we highlight four companies that typify the 23 participants in terms of their strategies and the challenges they've faced. For example, one company took the year 2000 issue and turned it into a systems upgrade opportunity. Another started to address the year 2000 problem way back in 1988.

NOT PLACING ALL ITS EGGS IN ONE BASKET

Commonwealth of Pennsylvania

Industry: *Government*

The Commonwealth of Pennsylvania's year 2000 problem is spread across 40 agencies and 28,000 computer programs. Its tax systems (personal income, corporation, inheritance and sales) and social services systems (welfare, unemployment compensation and law enforcement) are most critical. **"If they are not fixed, we could have real problems with our revenue streams coming in,"** says Charles F. Gerhards, director of Pennsylvania's central management information center in Harrisburg, Pa. **"We could be miscalculating the amount of revenue people owe us, for example. This has significant liability and exposure issues if these problems aren't fixed."**

PLAN OF ACTION: *Completion slated for June 1998*

The commonwealth's strategy is to act as an enterprise rather than approach the problem piecemeal. Although some conversion has been done with homegrown tools, the commonwealth has sent more than 200 solicitations to vendors. It will narrow the list to 15 to 20 products, and it plans to complete the entire project by June of next year. The bottom line? **"If a particular vendor ends up not being able to provide the services to our satisfaction, then we'd have an alternative to choose from,"** Gerhards says. **"We are trying to hedge our bets and put 15 to 20 vendors under contract and not put all our eggs in one basket."**

WORDS OF CAUTION:

— Watch for instability in software over the next few years as changes are made to numerous programs. **"This may result in a lot of inadvertent errors being created,"** Gerhards says.

— **"Don't try to develop yourself out of this. Writing brand-new software can be risky,"** Gerhards says.

TIME TO REPLACE AND UPDATE SYSTEMS

Heilig-Meyers Co.

Industry: *Retail*

The furniture company is doing more than just making systems in its 900 stores year 2000-compliant; it's also using the opportunity to replace and update systems. **"We don't just want to do a repetitive conversion — we want to upgrade certain systems, replace whole systems and improve interfaced systems and convert what's left,"** says Dan Shuber, director of systems development at the Richmond, Va.-based company.

THE BIGGEST CONVERSIONS:

Human resources, accounting and a freight-tracking application.

PLAN OF ACTION: *Completion slated for July 1998*

Although Heilig-Meyers used one commercial tool to help with analysis (Hawkeye Information Systems' Pathfinder), Shuber says the company prefers to develop most year 2000 tools in-house because off-the-shelf tools are too immature. **"Many of the tools were rushed to market because of the great opportunity. A lot of these first-generation tools have shortcomings. The analyzer tools have a certain footprint they look for when trying to identify dates, but that's not the only thing that a date looks like. There are derived dates, calculated dates, etc."** Shuber says tools will improve by 1998 or 1999, but **"by then it's too late."**

ADVICE:

If you start early enough, it's a great opportunity to evaluate, re-engineer and so on. Turn this into an opportunity.

REGRETS:
— That they hadn't started earlier. That would have allowed more time on the replacement strategy.
— That there are so few experienced peer companies with which to share strategies, ideas and information.

GETTING AN EARLY JUMP ON THE PROBLEM

The Hartford

Industry: *Insurance*

Because of the nature of the insurance business, officials at The Hartford knew they had to address the year 2000 problem well before the turn of the century.

"Some types of policies required the year 2000 date as early as 1993," says Peter Murphy, director of the Actuarial Services Division in Hartford, Conn.. **"These were seven-year bonds that expired in the year 2000."** Analysis on year 2000 started as early as 1988, and the overall completion date is set for the end of 1998, he says.

ONE ADVANTAGE TO THE EARLY START:
Quality assurance. **"We've built in enough time to be certain that everything is working properly. When 2000 comes around, we won't have to live with half-done systems and waste time and energy finding workarounds for uncompleted systems."**

PLAN OF ACTION: *Completion slated for end of 1998*
With 40 million lines of mainframe code to fix and an early deadline, The Hartford didn't want to spend a lot of time evaluating all the tools. **"That would have taken too much time away from the project at hand,"** Murphy says. **"The team looked at three to four products, tried them out, and based on a combination of ease of use and effectiveness, it selected [Millennium Dynamics, Inc.'s] Vantage 2000."**

The Hartford uses Vantage 2000 to scan code for dates and change the code. Murphy says the tool does what it's supposed to do and that the company is very satisfied with it. But he adds, **"In terms of ease of use, you do need some training and experience to use it."** Murphy says the company is looking at other tools to address other areas of the year 2000 problem.

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HIT WITH A DOUBLE WHAMMY

HOSTechnologies Geac

Industry: *Software vendor*

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SPEAKING FROM EXPERIENCE:
"Don't assume that all of your software vendors are fixing the problem," Wilkins says. Challenge them and find out what they're doing to address the problem, he says. **"The level of information given out by vendors is frustrating to many companies today."** □

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DAVE WILKINS
Field readiness manager
HOSTechnologies Geac
Atlanta

VOICES OF EXPERIENCE

Here's what your peers advise as you begin — or get deeper into — the year 2000 conversion process:

"As a first step, try to take a snapshot of the situation on an overall basis. Don't get bogged down in the details trying to analyze each system in extreme detail. Do a broad-stroke analysis in the beginning to get an idea of just how big the problem is. . . . You can drill down in the code later on."

JACK SAMARIAS
Vice president, technology services
National Association of Securities Dealers
Rockville, Md.

"If you have developed a system to do a specific part of your business, is that part of your business still relevant? If not, forget about the system. There's no point in analyzing if you can re-engineer the business function to eliminate that system."

LES MUSE
Director, information systems office
New York State Office of Mental Health
Albany, N.Y.

"If you have enough lead time, convert stand-alone systems and learn from the process before you attempt mission-critical applications."

JOHN FROHLICH
Director of emerging technologies
Blue Cross/Blue Shield of Ohio
Beachwood, Ohio

"Stay away from tools that are strictly year 2000. We want to make sure we don't just bring in a year 2000 tool to convert. We want the application teams to be able to use those tools going forward. Thus, vendors come in and actually mentor the application team on how to use the tools."

SYLVIA ZBOROWSKI
Senior manager, year 2000 solutions
MCI Communications Corp.
Atlanta

"Treat this as a strategic business project. If you treat it simply as a technical project, you will increase risk."

IRENE DEC
Year 2000 program director
Prudential Insurance Company of America
Roseland, N.J.

CONTINUED FROM PAGE 85

O'Connell, a research analyst at Gartner Group, Inc. in Stamford, Conn. People will have just finished their detailed analyses and will really understand how complex the problem is. Then they'll realize that they have no resources to fix the problem.

The other six respondents say their biggest fear is that business partners and vendors won't stay on top of year 2000 compliance. And that's something companies should be worried about, O'Connell says.

"If you're worried about your business partners, then to me that's an indication that you don't have the problem under control," says Leland Freeman, managing director of year 2000 services at Management Support Technology Corp. in Framingham. "It's an enterprise issue, so an internal technical solution is not enough. The solution has to embrace your external relationships."

The second-biggest trend drawn from the surveys: Lots of your peers are using homegrown solutions because they lack confidence in vendors' tools. Again, we did a reality check with some analysts. They say if you roll your own, you'll be sorry (page 93).

While on the subject of tools, we thought you'd like to find out about the commercial tools people are using. Page 93 has a roundup of tools and comments from your peers who are using them.

And below we highlight four companies that typify the 23 participants in terms of their strategies and the challenges they've faced. For example, one company took the year 2000 issue and turned it into a systems upgrade opportunity. Another started to address the year 2000 problem way back in 1988.

NOT PLACING ALL ITS EGGS IN ONE BASKET

Commonwealth of Pennsylvania

Industry: *Government*

The Commonwealth of Pennsylvania's year 2000 problem is spread across 40 agencies and 28,000 computer programs. Its tax systems (personal income, corporation, inheritance and sales) and social services systems (welfare, unemployment compensation and law enforcement) are most critical. "**If they are not fixed, we could have real problems with our revenue streams coming in,**" says Charles F. Gerhards, director of Pennsylvania's central management information center in Harrisburg, Pa. "**We could be miscalculating the amount of revenue people owe us, for example. This has significant liability and exposure issues if these problems aren't fixed.**"

The commonwealth's strategy is to act as an enterprise rather than approach the problem piecemeal. Although some conversion has been done with homegrown tools, the commonwealth has sent more than 200 solicitations to vendors. It will narrow the list to 15 to 20 products, and it plans to complete the entire project by June of next year. The bottom line? "**If a particular vendor ends up not being able to provide the services to our satisfaction, then we'd have an alternative to choose from,**" Gerhards says. "**We are trying to hedge our bets and put 15 to 20 vendors under contract and not put all our eggs in one basket.**"

— Watch for instability in software over the next few years as changes are made to numerous programs. "**This may result in a lot of inadvertent errors being created,**" Gerhards says.
— "**Don't try to develop yourself out of this. Writing brand-new software can be risky,**" Gerhards says.

TIME TO REPLACE AND UPDATE SYSTEMS

Heilig-Meyers Co.

Industry: *Retail*

The furniture company is doing more than just making systems in its 900 stores year 2000-compliant; it's also using the opportunity to replace and update systems. "**We don't just want to do a repetitive conversion — we want to upgrade certain systems, replace whole systems and improve interfaced systems and convert what's left,**" says Dan Shuber, director of systems development at the Richmond, Va.-based company.

Human resources, accounting and a freight-tracking application.

Although Heilig-Meyers used one commercial tool to help with analysis (Hawkeye Information Systems' Pathfinder), Shuber says the company prefers to develop most year 2000 tools in-house because off-the-shelf tools are too immature. "**Many of the tools were rushed to market because of the great opportunity. A lot of these first-generation tools have shortcomings. The analyzer tools have a certain footprint they look for when trying to identify dates, but that's not the only thing that a date looks like. There are derived dates, calculated dates, etc.**" Shuber says tools will improve by 1998 or 1999, but "**by then it's too late.**"

If you start early enough, it's a great opportunity to evaluate, re-engineer and so on. Turn this into an opportunity.

— That they hadn't started earlier. That would have allowed more time on the replacement strategy.
— That there are so few experienced peer companies with which to share strategies, ideas and information.

GETTING AN EARLY JUMP ON THE PROBLEM

The Hartford
Industry: *Insurance*

Because of the nature of the insurance business, officials at The Hartford knew they had to address the year 2000 problem well before the turn of the century.

"**Some types of policies required the year 2000 date as early as 1993,**" says Peter Murphy, director of the Actuarial Services Division in Hartford, Conn. "**These were seven-year bonds that expired in the year 2000.**" Analysis on year 2000 started as early as 1988, and the overall completion date is set for the end of 1998, he says.

Quality assurance. "**We've built in enough time to be certain that everything is working properly. When 2000 comes around, we won't have to live with half-done systems and waste time and energy finding workarounds for uncompleted systems.**"

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*For a limited time only, Compaq is offering reseller partners a rebate of $400, effectively putting the starting street price at $3,900. Monitor sold separately. Offer valid to resellers on Models 5000 1P/2.1/32ML/CDS, 5000 1P/2.1/64ML/CDS and 5000 1P/4.3/ 64ML/CDS. **64MB memory module free with purchase of Model 5000/4.3/64/GL/CDS. Offers valid from February 1, 1997 through April 30, 1997. Please contact your channel partner for more details. ©1997 Compaq Computer Corporation. All rights reserved. Compaq registered U.S. Patent and Trademark Office. Compaq Professional Workstation is a registered trademark of Compaq Computer Corporation. The Intel Inside Logo and Pentium are registered trademarks and the Pentium Pro Processor Logo is a trademark of Intel Corporation. All other brands and product names are trademarks or registered trademarks of their respective companies. In Canada, we can be reached at 1-800-567-1616.

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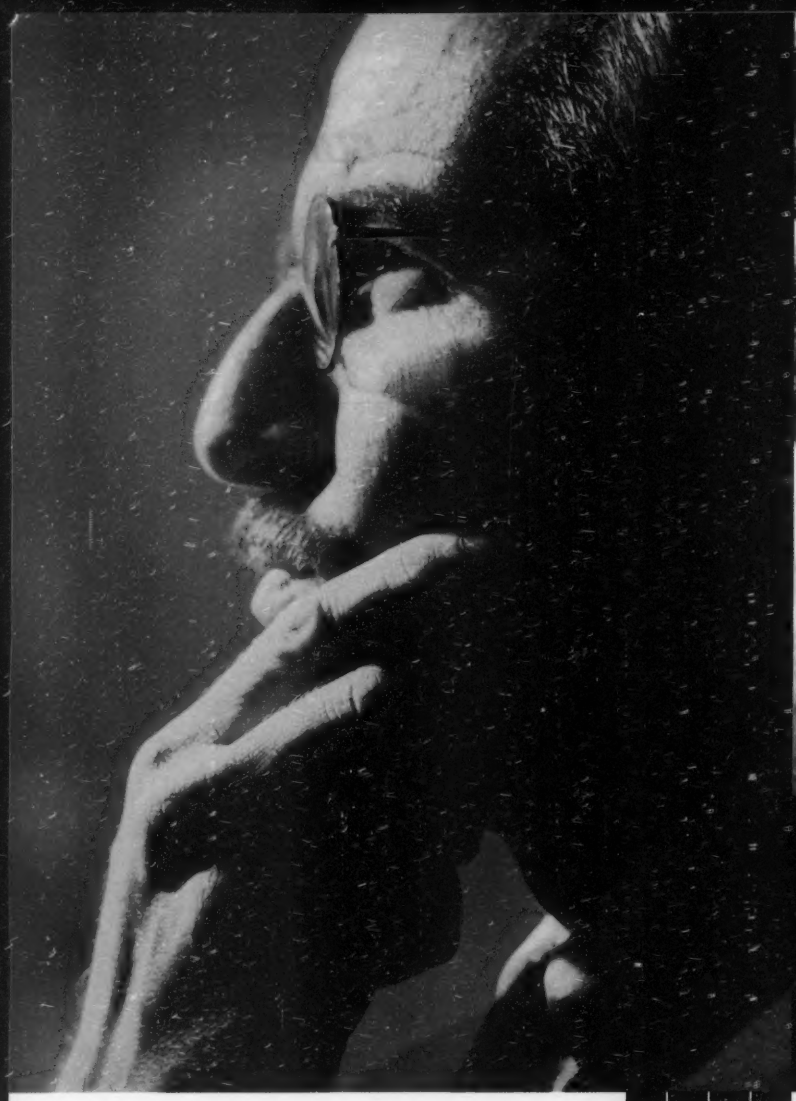

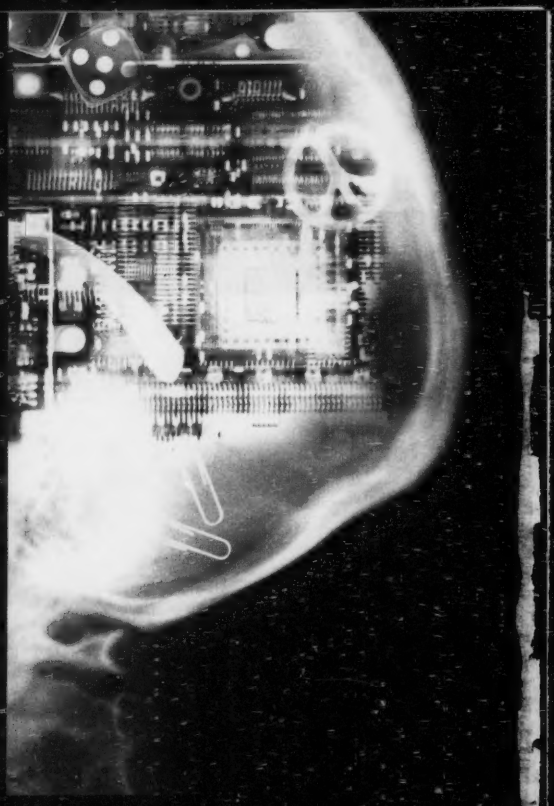

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The sharpest minds in the computer industry today go head-to-head in a raucous game of ultimate computer trivia. The 1997 Computer Bowl, with celebrity host Robert Urich, April 18th at the Santa Clara (CA) Convention Center and The Computer Museum, Boston. All proceeds benefit The Computer Museum's educational programs.

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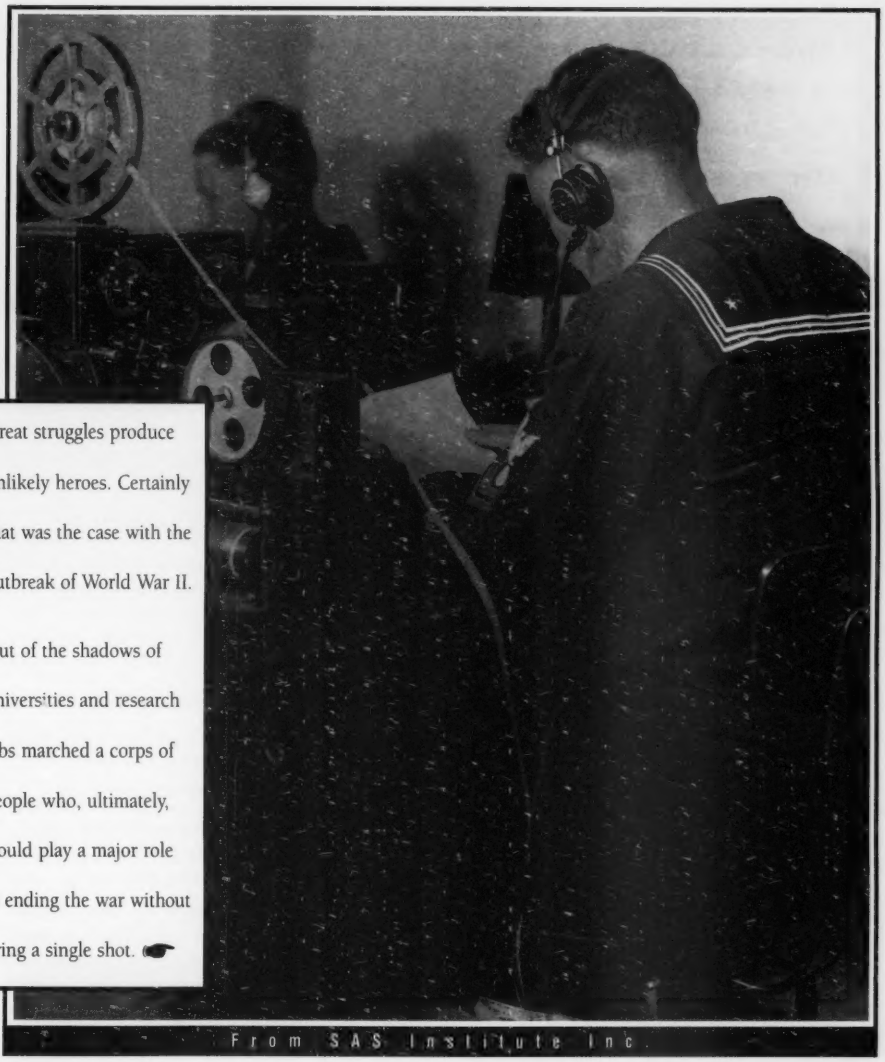
Test your wits now — play The Computer Bowl online at Internet Shopping Network, www.isn.com.
Sponsorship and seats are limited. Call now, 415.323.1909, browse www.tcm.org or e-mail, allison@tcm.org, for ticket or sponsorship information.
The Computer Bowl contest is taped for broadcast as a special edition of PBS' "Computer Chronicles," airing the week of June 3rd. Check your local PBS listings.

The Tools to Reinvent IT



Great struggles produce unlikely heroes. Certainly that was the case with the outbreak of World War II.

Out of the shadows of universities and research labs marched a corps of people who, ultimately, would play a major role in ending the war without firing a single shot. ☛

From SAS Institute Inc.

(continued from page 1)

These heroes were statisticians and math whizzes who banded together to form a group of ace code breakers. They took incomprehensible data and turned it into information. Top strategists then turned that information into knowledge to preempt enemy moves and win battle after battle until the war was over.

So it is today with you, the IT community. The businesses, hospitals and governments you work for are in battle. At times, the enemy is rising costs. And at others, it is domestic or international competition or simply the breakneck pace of innovation.

The Tools to Decipher Data

No matter the foe, the ultimate weapon today is knowledge. Knowledge of the business, of the market, of your customers and of the economy. Knowledge that is based on information from an ever-widening array of data sources—from your company's legacy data, to the Internet and third-party information providers, as well as ancient flat file databases.

This data, like the hieroglyphics that first confronted the code breakers, often comes in forms that are virtually unusable to end users. It must be transformed into a high-quality, usable format.

That's only the beginning, however. The business strategists and analysts must be given a set of tools with which this store of clean data is optimized to work. Only then can the strategists see the data as information and from that information gain knowledge.

Along this path to knowledge, the mission and the very identity of the IT community will be transformed, just as it was for the code breakers. Extracting the real value-added information from operational data becomes the new commitment for IT, which will be reinvented as a true strategic partner in the enterprise, uniting IT strategy with the goals of the organization.

The Tools to Succeed

"Isn't this what IT has been doing for years, uniting IS with the business?" you ask.

Well, consider this. For three of the last four years, the number one challenge listed in Computer Sciences Corp.'s annual survey of IS managers was aligning IS with corporate goals. If real progress were being made in this fight, then why would it continue to top the list of issues?

It is not that IT hasn't tried to carry out its mission. The problem may be that it hasn't had the complete set of tools needed to finally break the code of all that operational data, put it into a usable form and then provide users with the tools to analyze and exploit it.

Now that has changed. Not only are the tools available, but they are offered by a company that understands decision support is as much about the process of going from data-to-knowledge as it is about technology. It is also a company whose partnerships with hardware leaders like Sun Microsystems, Inc. give IT the most complete and integrated end-to-end solutions available. The company is SAS Institute, and it is looking to make heroes out of people like you in today's competitive battles. ■

Technologies That Make the Business Vision Work

"IT can serve as the coordinator among different business units," notes Frank Gillett, senior analyst at the Hurwitz Group in Newton, Mass. Because "only IT has the overall vision of data in the enterprise. IT can supply the technology to make the business vision work." And to *reinvent* IT.

These tools need to recognize the harsh realities of today's world. Realities like mixed hardware environments, incompatible data formats, tight-fisted IT budgets and requirements to scale up or down—and quickly.

"SAS software can be moved from one application to another as SAS customers move their applications," says Stephen Graham, vice president of software research at IDC Canada in Toronto. "SAS software is very malleable, which is something SAS users look upon as a strength."

Donna Rubin, data warehousing manager at Sun Microsystems, Inc., agrees. "SAS software has a history of being among the primary tools used before people knew the terms data warehousing and DSS (decision support systems). The company understands that IT needs to evolve a computing architecture over time, that you need a single view of the enterprise and not a bunch of incompatible datamarts."

The new IT commitment is to turn operational data into knowledge.

Open, End-to-End Data Warehousing

The SAS Data Warehouse remains the only open, end-to-end data warehouse solution. While many users lean toward an end-to-end warehouse solution—63% according to one survey—many others prefer to mix compatible products into their existing solutions. SAS users can do either because SAS software was designed to be fully platform and database independent from the start. And SAS Data Warehouse solutions are *fully Web-enabled.* This means IT can distribute and share warehouse data across corporate intranets. Because of capabilities such as these, data mining is fast becoming the tool of choice for exploiting the volumes of clean, scrubbed data IT has provided to the warehouse. It is an advanced technology that helps predict future outcomes and reveals trends and patterns from massive amounts of data.

Plus a Complete OLAP Toolbox

SAS Institute also supplies a set of hardware-independent tools for OLAP (on-line analytical processing). These tools, which are fully integrated with the SAS Data Warehouse, allow users to create multiple views of business data to permit "what-if" modeling on a comprehensive scale. SAS OLAP tools, for instance, have enabled Dun and Bradstreet to deliver superior, targeted information to its 70,000 customers around the world.

Find Out More in Our Free White Paper... Including the Five Deadly Sins of Data Warehousing

Visit our web site at **www.sas.com/** to learn more about SAS Institute's integrated approach to data warehousing, OLAP and data mining.

Our home page features SAS Institute's newest white paper, *Reinventing the Future of IT.* Click on the title to read the complete text or request your free printed copy. In this white paper Bill Laberis, president of Bill Laberis Associates and former editor-in-chief of *Computerworld,* explores the "Five Deadly Sins of Data Warehousing." He also examines data warehousing's return on investment (ROI) as reported by 62 large corporations worldwide.

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Integrated Warehouse Strategy Helps HMO Triple Business in Two Years

Health care providers and HMOs today have a lot in common with IT organizations. Each is being asked to provide increasingly higher levels of service and support without the benefit of big increases in funding. "Work smarter," it says on their marching orders.

Two years ago, Oxford Health Plans Corp. of Norwalk, Conn., set out to increase its base of 400,000 members and subscribers dramatically, while boosting the quality of service for individual members by an order of magnitude. The key to success lay in turning gigabytes of data from a mishmash of sources into knowledge that could be applied to increasing the quality of member coverage and care.

It was a daunting task, to say the least. Coverage providers like Oxford were feeling the same cost containment pinch that has gripped the entire $800 billion U.S. health care industry. Plus, Oxford's internal systems were themselves a wild assortment of architectures that included IBM's OS/2®, AIX® and PC DOS, Microsoft Corp.'s Windows® and Sun Microsystems' SunOS™. Internal databases spanned the spectrum from Oracle Corp.'s ORACLE® and Sybase, Inc.'s SYBASE® to Microsoft's FoxPro®.

"We needed a universal decoder ring," recalls Scott Stratton, Oxford's director of medical analysis. "That's what SAS software proved to be."

Under Stratton's direction, Oxford developed a data warehouse strategy based on SAS Institute's warehouse and data mining solutions. The result? Oxford has grown to more than 1.5 million subscribers—and counting. More importantly, Oxford's world class patient management system is delivering subscriber services based on *anticipating* the medical needs of patients, not simply reacting to them.

For example, some HMOs collect data from a patient's emergency room admissions or from repeat hospital visits, and from that data, they prescribe a treatment plan. "But by then, patients have spun out of control," notes Stratton.

With SAS data mining tools now working in tandem with the SAS data warehouse, Oxford's analysts can examine patient data from far more sources and incorporate third-party data as well. With this information, Oxford can prescribe a more comprehensive and preventative treatment plan than before, designed to keep hospital visits to a minimum. That benefits both the patient and Oxford.

Oxford
The Health & Healing Company.™

Also, prior to installing the SAS data mining solution, it took a week and a half for Oxford to generate a standard profile of primary care physicians. With the SAS tools, Stratton says, Oxford can now incorporate "three times the data into the reports," which are generated in a day and a half. "The productivity is awesome."

Oxford received an additional benefit from its SAS implementation. It found that the SAS data mining tools "run like a champ" on Sun hardware, including the Ultra Enterprise 1, Ultra Enterprise 2, SPARCstation 5 and Sun's SPARCserver 1000. In fact today, Stratton says, "The Sun systems are our workhorses."

Oxford's early experience with the Sun-SAS software team has encouraged them to install the SAS Scalable Performance Data Server on Sun's super-fast SMP processor.

Of his decision to go with the SAS data mining solution, Stratton says, "We needed a cross-platform product that could scale, given our growth." And software that was truly hardware independent, given the mix of systems Oxford had at the start.

"We got all that and more with SAS software," Stratton says. "There are minimal worries about upgrades. Their tool kit is unmatched. SAS Institute has a great knowledge of the workings of the entire system. It just makes it easier to integrate everything." ■

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MIXED BAG:

Many of the tools mentioned in our survey were homegrown, not off-the-shelf. Five respondents are using only homegrown, and seven are using a mix of homegrown and commercial tools. Lack of confidence in vendors was the reason cited by many for creating their own solutions. They prefer to use their own tools to ensure the job is done right.

But a reality check with an analyst at Gartner Group, Inc. in Stamford, Conn., showed that such an approach may have ramifications at the end of the cycle, when IS professionals try to put systems back into production.

"If they're looking at using an in-house source management product without leveraging the capabilities of some of the really sophisticated software change-management products like Endevor or even Version Manager from Princeton Softech ... the production turnover is going to be a disaster," says Gartner's Michael O'Connell. "I've never seen an in-house testing tool that can provide the date-simulation capabilities of any off-the-shelf date simulators."

Of the 18 managers who said they're using some vendor tools, 12 chose to use vendor tools only. And even at this seemingly late stage, six of the 18 aren't yet sure which tools they'll use. □

TOOLS used by survey respondents, and some comments from the users:

HOURGLASS
Axios Products, Inc.
Hauppauge, N.Y.
www.icp.com/axios/
Blue Cross/Blue Shield of Ohio recently started using Hourglass as a year 2000 simulation tool to help with testing.

PATHFINDER
Hawkeye Information Systems
Fort Collins, Colo.
(970) 498-9000
Heilig-Meyers uses Pathfinder for analysis work. **"It did everything we asked it to do; it goes as far as it can,"** says Dan Shuber, director of systems development.

VANTAGE 2000
Millennium Dynamics, Inc.
Cincinnati
(800) 892-7431
"We chose this product because it seems to be simple to use and ready to be used," says Mike Wohn, assistant vice president at General Accident Insurance Company of North America in Philadelphia. Wohn gave Vantage 2000 a rating of 4 on a scale of 1 to 5, in which 5 is very satisfied.

HOURGLASS 2000
Mainware, Inc.
Maple Plain, Minn.
www.mainware.com
At the time of selection, **"it was the best tool for us, and we are actively using it. It has met our needs,"** Wohn says. Hourglass 2000 is used at Kemper Insurance Cos. in Long Grove, Ill., as a data-spoofing tool. Mitch George, data administrator officer, gave it a 5 rating.

VERSION MERGER
Princeton Softech, Inc.
Princeton, N.J.
www.princetonsoftech.com
"Version Merger is an excellent tool for integrating and reconciling year 2000 changes with ongoing maintenance and enhancements," says Dave Wilkins, a field readiness manager at HOSTechnologies Geac. He gave Version Merger a rating of 5.

PORTAL 2000
Prince Software, Inc.
Ramsey, N.J.
(800) 934-2022
"Portal 2000 works well. It is very easy to use and takes little effort to initiate," Wilkins says. He gave it a 4 rating.

SIGNATURE 2000
Computer Horizons Corp.
Mountain Lakes, N.J.
(800) 321-2421
This vendor has **"much more comprehensive coverage of different language types and different portions of a system that can be analyzed than do the other vendors at this point,"** says Mike Yack, manager of information services at Square D Co. in Knightdale, N.C. He rated it a 5.

C-MILL
Formula Systems Ltd.
Israel
Blue Cross/Blue Shield of Ohio used this tool to identify all the date fields, program interrelationships and file sharing. **"C-Mill has been very flexible. If we run into an area where we can't convert something, Formula Systems has modified the code, and we've been able to get through it,"** says John Frohlich, director of emerging technologies at Blue Cross/Blue Shield in Beachwood, Ohio.

ALLIANCE
Viasoft, Inc.
Phoenix
www.viasoft.com
Phillips Petroleum Co. in Bartlesville, Okla., has been able to work directly with the vendor to handle questions and work out bugs with Alliance itself. Phillips is satisfied with this tool because of the access to the vendor, according to Del Clark, information technology director. He rated it a 4.

REVOLVE/2000
Micro Focus, Inc.
Palo Alto, Calif
www.microfocus.com
Revolve/2000 is used for code analysis at Kemper Insurance. **"We partnered with them on a reduced-cost basis in return for product/customer reference,"** says Mitch George. He gave the product a 5 rating.

INSIGHT
Compuware Corp.
Farmington Hills, Mich.
www.compuware.com
Phillips Petroleum was already familiar with Insight because it was using it for more than year 2000 projects. Phillips gave it a 4 rating.

Commonly cited user observations on year 2000 tool inadequacies

- **Lacks the ability to categorize all the data code instances found.**
- **Would like a tool that uses algorithms to identify probable dates in live data fields and that can run during daily processing.**
- **Would like a tool box that physically does replacement intelligently as a repeatable process.**
- **Would like tools for other platforms. Most vendors are trying to hit the mainframe and MVS environments. Very few target midrange or client/server platforms.**
- **Would like tools that offer more careful analysis of code. For example, to identify where the damage is. Also would like tools to be parameter-driven, to seek out specified information.**
- **Would be desirable if the tools could provide an internal audit of what's already been done.**
- **Would like a tool that could find all the operating systems components and the associated year 2000-compliance information.**
- **Would like a tool that supports multiple languages and can run from inventory to conversion with minimal input from the user.**
- **The tools aren't smart enough to determine that the logic being used with these date fields is already year 2000-compliant.**

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In Depth

WILL THE REAL UNIVERSAL SERVER PLEASE STAND UP?

By Jerry Held

It's time to clear the air. In the past few months, Informix Software, Inc. has conducted a campaign of misinformation that has created confusion about an important transition in the database industry. To listen to Informix, you'd think it has defined a new class of database that does everything for everyone and is a real product today.

Nothing could be further from the truth.

Oracle Corp. last February delivered a world's first — Oracle Universal Server, with the Oracle7.0 database as its core. It was the first general-purpose database management system to integrate support for multimedia data and to incorporate optimizations for new classes of applications such as data warehousing.

Today, thousands of customers worldwide use Oracle Universal Server to run their businesses. Oracle also is in the final phase of testing the second generation of Oracle Universal Server, based on the Oracle8.0 database technology.

Informix, meanwhile, has yet to ship its first Informix-Universal Server (IUS) for general availability. Its announcement in December was what any other company would call a beta release. The product had been tested for only a few weeks; runs on only a few platforms; can be bought only with a month of consulting; and shouldn't be used to run production applications.

The simple fact is, Oracle has the product now and Informix doesn't.

So what is a universal DBMS? It isn't just object/relational. It isn't just multimedia. It isn't just extensible. In our view, a universal DBMS does it all. That means it supports the following:

- Multimedia data types (such as text, video and spatial data).
- Extensibility (the ability to add third-party code to a base platform).
- Multiple data models (such as relational, multidimensional and object models).
- Multiple types of applications (for instance, transaction processing and data warehousing).

By serving all these needs in one product, a universal DBMS enables new classes of applications and reduces the training and administrative costs of the multiple DBMSs it replaces.

Now let's compare Oracle and Informix.

Multimedia data types. Support for new types of data such as text, image, video and spatial data is of growing importance for many applications, especially those that involve the Internet. Oracle Universal Server has integrated support for multimedia data into the database engine. Oracle supports the most important data types and has integrated them for high performance and reliability.

Tightly integrated multimedia has been in production with Oracle Universal Server for a year and has been imple-

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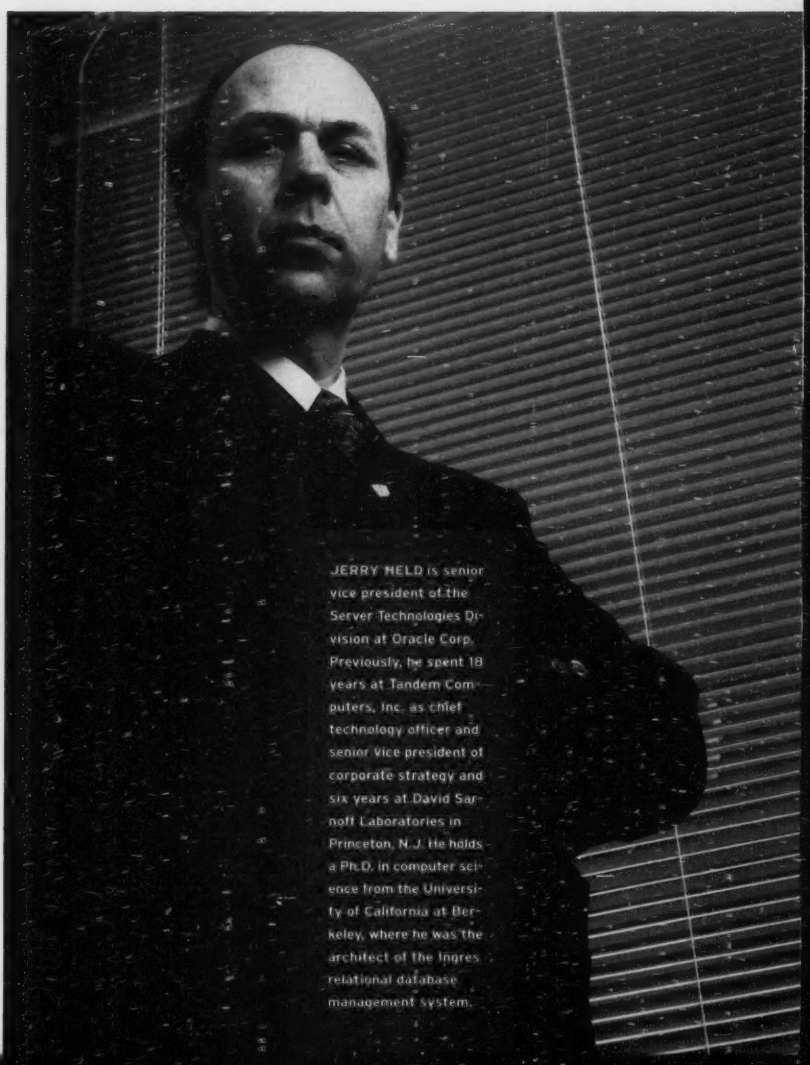
JOHN HARDING



JERRY HELD is senior vice president of the Server Technologies Division at Oracle Corp. Previously, he spent 18 years at Tandem Computers, Inc. as chief technology officer and senior vice president of corporate strategy and six years at David Sarnoff Laboratories in Princeton, N.J. He holds a Ph.D. in computer science from the University of California at Berkeley, where he was the architect of the Ingres relational database management system.

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(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

App. Dev.Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No
Intranet Products ❑ Yes ❑ No

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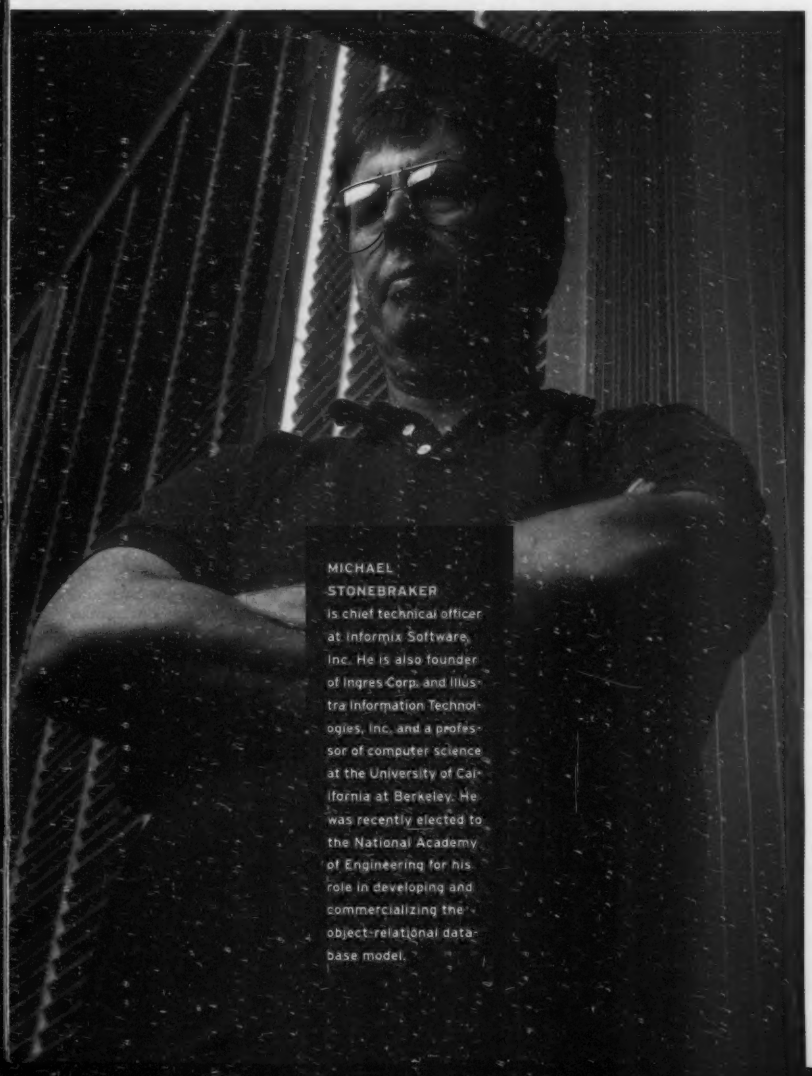
WHO'S EXTENSIBLE? SCALABLE? AVAILABLE? WE ASKED INFORMIX AND ORACLE – AND THERE SEEMS TO BE A SMALL DIFFERENCE OF OPINION



MICHAEL STONEBRAKER is chief technical officer at Informix Software, Inc. He is also founder of Ingres Corp. and Illustra Information Technologies, Inc. and a professor of computer science at the University of California at Berkeley. He was recently elected to the National Academy of Engineering for his role in developing and commercializing the object-relational database model.

By Michael Stonebraker

Let's clear away the fog. A true universal server system adds object-relational capabilities — such as base-type extension, user-defined functions, complex object support, inheritance and polymorphism — to a SQL database management system. That allows users to manage all their data, not just numbers and character strings. In other words, a universal server system adds capabilities to a DBMS that have long been present in object-oriented programming languages such as C++ or Smalltalk.

So when it comes to universal server architecture, Informix Software, Inc. is the only game in town. Informix has the only object-relational DBMS shipping today on multiple Unix platforms (and will be available on Windows NT in the next quarter). A full-function object-relational DBMS is what powers a real universal server system. That means a single, integrated engine with native support for data type extensions (what we call DataBlade modules).

Informix-Universal Server (IUS) has all the strengths of a relational DBMS — parallel processing and data partitioning capabilities, data integrity, comprehensive distributed database management and data replication. IUS gives organizations the ability to manage all their data, including rich, complex data types.

Informix is, in short, driving the agenda of the database market.

This hasn't been lost on Oracle Corp.; witness its saber rattling in the past year. Oracle doesn't have an object-relational DBMS today and won't have one in Oracle8.0. Moreover, we'll be near the next millennium before Oracle8.1 or 8.2 incorporates data cartridge technology.

The Oracle fear, uncertainty and doubt factory has been in overdrive for the past year trying to obfuscate this fact. With Oracle8.0 about to be introduced (after being announced four years ago), the truth concerning Oracle's lack of object-relational database technology is coming to light.

IUS is a full-function object-relational DBMS that supports all object-relational constructs, including base-type extension, user-defined functions in a variety of programming languages, sets of objects, inheritance and polymorphism. New kinds of objects can be added to IUS by anyone, anytime. Currently, 29 DataBlade modules are available; dozens more are in the pipeline.

IUS is in production now. Leading companies such as Credit Suisse First Boston, Sabre Decision Technologies and GDE Information Systems are adopting IUS for flexible, comprehensive enterprise solutions.

As far as we can tell, Oracle has four proposals for supporting extended functionality. First is Oracle7.3, a RDBMS with hard-wired support for four additional kinds of objects, through a combi-

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JOHN HARDING

INFORMIX FORCES EVERYTHING AND THE KITCHEN SINK INTO THE DATABASE.

–JERRY HELD

ORACLE'S FEAR, UNCERTAINTY AND DOUBT FACTORY HAS BEEN IN OVERDRIVE THE PAST YEAR.

–MICHAEL STONEBRAKER

CONTINUED FROM PAGE 96

mented in customers' World Wide Web sites, training systems and other applications. Oracle Universal Server has this in general availability now. IUS doesn't.

Extensibility. Extensibility refers to a mechanism by which third parties can add capability to a base product. For example, extensibility in client platforms such as browsers has taken the form of plug-ins. Oracle has defined Network Computing Architecture, which provides a robust, high-performance environment with extensibility at the client, application server and database server. That allows third parties to add value at any tier of the architecture.

Most of the extensibility will occur in the middle (application) tier, not in the data server. And because Oracle is providing built-in support for the most popular new data types, these will be extremely fast and safe and will further reduce the need for data server extensibility. Where extensibility is required, Oracle provides an open and safe mechanism through data cartridges.

The Informix approach forces everything and the kitchen sink into the database. That opens up the database kernel to potential bugs in all embedded third-party code. And it will likely end up corrupting someone's critical database — someday, that is, when IUS actually starts running production databases. And by relying on third parties for most of its new functionality, Informix is creating a support nightmare for its customers. Whom do you turn to when you get cut by a DataBlade?

Oracle has taken responsibility for the most important new features and has a comprehensive and safe approach to extensibility. Informix hasn't and doesn't.

Multiple data models. The data model is the way users think about the organization of data. Oracle Universal Server extended the relational database to include the multidimensional data model. In the Oracle8.0 release, Oracle Universal Server is rearchitected to follow SQL3 and include native support for the object data model.

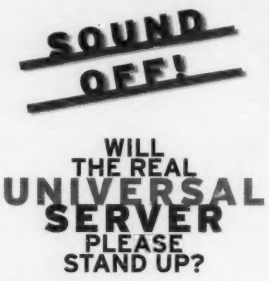
Oracle will provide object access to all relational data. Informix won't.

Multiple types of applications. Oracle Universal Server was designed to support the very rigorous demands of online transaction processing (OLTP) applications and has been extended to support the complex query processing of data warehouse applications. For the first time in a general-purpose DBMS, all the specialized optimizations have been included for bitmap indexing, star queries, parallel query and other accelerators to handle high-performance, decision-support applications.

So who has the best solution? Informix doesn't have a single product that is truly universal. In fact, the company has the following three very different and distinct products:

- Informix DSA 7.x for OLTP and symmetrical multiprocessing (SMP) hardware.
- Informix XPS 8.x for data warehousing and cluster/massively parallel processor (MPP) hardware.
- IUS with extensibility and third-party multimedia.

According to the most optimistic projections from Informix company executives, the Informix-Universal Server (perhaps better called the Informix-Extensible Server) will be in general availability by midyear. And the three products listed above won't come together as a true IUS until at least the end of 1998 (more likely 1999).



Since early last year, Oracle Universal Server has directly supported multimedia data types, multiple data models and multiple types of applications. It is available in production on every type of computer architecture — from uniprocessors and SMPs to clusters, MPPs and Non-Uniform Memory Access — and across almost every operating system. A fully tested version of the second generation of Oracle Universal Server will be in general availability on all platforms in just a few months. It also comes with comprehensive development and systems management tools support from Oracle and third parties.

If you want a true universal DBMS — one product that does it all — Oracle has it now. Informix doesn't. □

CONTINUED FROM PAGE 97

nation of separate servers and front-end simulators. There is limited SQL support for these extensions. Although it is marketed as a "universal server" system, Oracle7.3 embodies none of the object-relational concepts of type extension, user-defined functions, complex object support, inheritance or polymorphism. As such, Oracle7.3 can't compare to Informix's system.

Oracle7.3 has added four more data types. Unfortunately, hard-coding a few additional data types doesn't meet the needs of most customers. What's needed instead is an extension mechanism whereby third parties can add any kind of object to a SQL engine. That's exactly what IUS does.

A second Oracle system, Oracle8.0, is in beta testing and is scheduled to ship later this year. A well-guarded secret is that Oracle8.0 is primarily a scalability and performance release aimed at correcting Oracle deficiencies (such as the absence of data partitioning). As such, it has very limited additional support for objects relative to Oracle7.3. The only objects supported by Oracle8.0 are rows of numbers and character strings.

And while Oracle8.0 includes limited support for inheritance, it has none for polymorphism. As such, it's no rival to a real object-relational DBMS such as IUS.

Then comes the third Oracle proposal: its Network Computing Architecture (NCA). This embodies the notion of data cartridges. Using NCA, one application program can call a second, which is thereby "plugged in to" the first. Plug-ins are useful for building componentized applications. But they aren't object-relational DBMSs, which provide management and integration of a complete collection of stored objects. Comparing NCA to IUS is silly.

Finally, data cartridges will apparently appear in either Oracle8.1 or 8.2, both of which are slated for delivery in 1999. When this occurs, Oracle will finally offer a plausible object-relational server. However, it's difficult to compare IUS, a production system, with systems that haven't been designed yet.

Here are some concluding observations about the approaches of the two companies:

The object-relational capabilities in Oracle7.3 and 8.0 are woefully inadequate, and NCA isn't an object-relational DBMS at all. And we can't know what sort of object-relational functionality will be in Oracle8.1 or 8.2 because they are still being designed. In contrast, IUS is a full-function object-relational DBMS.

IUS is shipping now. In contrast, Oracle won't ship a plausible system earlier than 1999 and perhaps not then.

The IUS engine understands numbers, character strings and objects at all levels of the system. That means the optimizer, sort engine, executor and access methods are all "object-aware." Only this degree of integration can achieve high-performance object filtering, sorting and indexing. Oracle appears to be proposing looser integration in its data cartridges that won't support any of these functions.

Oracle data cartridges also will be called using the Common Object Request Broker Architecture (CORBA) protocol. In contrast, DataBlade modules are typically called using local procedure call (LPC). Our experience with 1,500 Illustra licenses was that essentially all of them used LPC; remote procedure calls slowed the application by orders of magnitude. Oracle has chosen a ruinously expensive approach.

DataBlade modules are absolutely safe. All are certified according to our rigorous quality standards. There has never been a recorded case of a DataBlade module causing a crash or data corruption.

Oracle's internal extensions (such as Context), if rigorously tested, are also safe. Third-party data cartridges, however, will use CORBA and seriously degrade performance. Oracle is thus treating its partners as second-class citizens.

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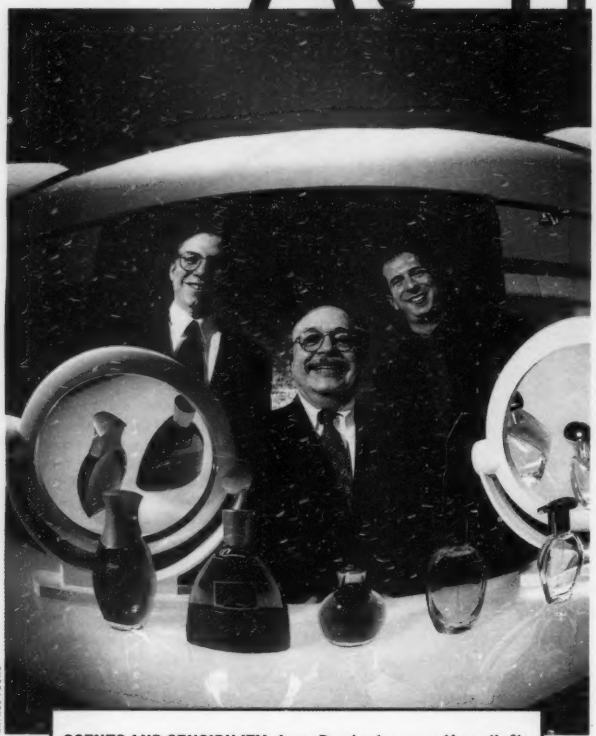
IT Careers

ANNUAL SURVEY: THE BEST CORPORATE IS TRAINING PROGRAMS

TOPS At Training

Great IS training programs go beyond supporting corporate goals. They also offer the training employees need for career development. *Computerworld* looks at 25 firms that do it best.

By Linda Wilson



RAFAEL FUCHS

SCENTS AND SENSIBILITY: Avon Products executives (left to right: Adrian Dessi, CIO Ronald Mastrogiovanni and Barry Herstein) know that the key to effective training is to make it serve an employee's needs

BAY NETWORKS, INC. managed to get 600 users running on SAP AG's R/3 in just nine months — much less time than the two-plus years many corporations spend installing the notoriously complex suite of business applications.

Even more surprising is that Maynard Webb, vice president and chief information officer at Bay Networks, credits much of the R/3 project's success to the information systems department's training program.

"We had to get people familiar with the product and with what we expected as far as behavior on the team," Webb says. SAP team members received more than 120 hours of training on technical issues and people skills, such as teambuilding and change management. That included formal classes, hands-on training and biweekly meetings.

To ensure that the training stuck, Bay Networks, in Santa Clara, Calif., decided that part of the team members' compensation would be based on end users' assessment of the project. The result? Rave reviews from users, and SAP team members received big bonuses and experience with one of the industry's hottest skills.

BUT THERE'S NO TIME...

IS managers cited the following challenges to offering effective training programs:
(Ranked by number of responses)

1. Finding the time to offer training
2. Staying current with technologies
3. Meeting demands of just-in-time training
4. Finding qualified trainers (in-house and external)
5. Managing the cost of training
6. Making sure training content is relevant

ANNUAL SURVEY

Attention to training helped Bay Networks earn seventh place in *Computerworld*'s 1997 list of the top 25 corporate IS training programs. *Computerworld* surveyed Fortune 1,000 companies and leading consulting firms. They were asked questions about their IS training programs, including the number of days devoted to training, the amount spent per employee on training and the number and types of training courses offered. Equally important, the survey asked about individualized training plans that benefit each IS employee. The ranking was based on responses from 235 companies.

Good information technology training programs usually have one

Tops at training, page 102

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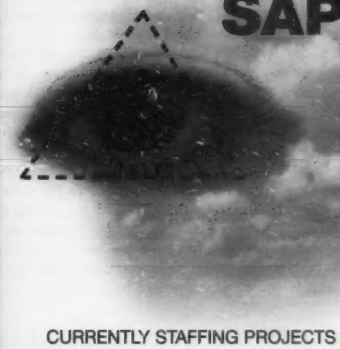

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TOPS At Training

CONTINUED FROM PAGE 100

thing in common: training that was designed to support corporate goals. Top IT training programs take it a step further: They allow all IS employees to develop their skills and career opportunities, and they make training mandatory for advancement and bonuses.

At Avon Products, Inc. in New York, training has become a large part of the annual review process. Training goals are set to address corporate needs and individual growth.

During Avon's "performance development process," IS employees are rated on 12 job-specific skills. Programmers, for example, are expected to understand how technologies work and how to build useful applications.

As part of the process, associates, as employees are called, and their managers develop a plan for the upcoming year that includes specific and realistic training goals. "It is a contract between our manager and our associates," says Ronald Mastrogiovanni, senior vice president and CIO at Avon. The associates and their managers are held accountable for meeting those goals.

Benefits to the employees are obvious. "Too many times people in IT get pigeonholed," Mastrogiovanni says. "What we are building here is a long-term career."

Like Avon, Bay Networks believes in using training as a way to increase the skills of its employees.

Bay Networks is the result of a merger two years ago between Synoptics Communications, Inc. in Santa Clara, Calif., and Wellfleet Communications, Inc. in Billerica, Mass. Many of the existing information systems weren't robust or flexible enough to suit the needs of the combined organization.

Webb joined Bay Networks after the merger. He hired Ernst & Young to inventory the skills that IS employees already possessed and the skills employees would need in the future, for the company and their own benefit.

Webb then developed training programs designed to fill skills gaps on a project-by-project basis. The skills assessment process is "something we need to formalize so that it is something we do at least annually because technology changes," he says.

When Ernst & Young did the assessment 18 months ago, there was one glaring hole: Nobody knew anything about R/3. That shortfall became a priority in a new training initiative. Eventually, Bay Networks spent less than five times the cost of a 900-seat software license and associated hardware. Webb says he is convinced the training program and a project-specific compensation structure are responsible for the savings.

The program was so successful that team members earned hefty bonuses of 10% or more of their salary, depending upon their position in the organization. Team members also positioned themselves as the top project managers and technologists in the organization.

Computer Associates International, Inc. also offers training that is in sync with corporate goals and that develops individual communication and business

	TOP 25 EMPLOYERS FOR TRAINING	LOCATION	DAYS SPENT IN TRAINING	TRAINING COST PER PERSON	TRAINING BUDGET CHANGE FROM '96	EMPLOYEES WITH TRAINING PLAN	COMPONENTS: SKILLS INVENTORY
1.	Avon Products, Inc.	New York	16-20	$15,000 plus	20% increase	100%	yes
2.	Price Waterhouse	New York	more than 20	$6,600	35% increase	100%	yes
3.	The Home Depot, Inc.	Atlanta	11-15	$4,750	10% increase	90%	yes
4.	Computer Associates International, Inc.	Islandia, N.Y.	11-15	$15,000	5% increase	100%	yes
5.	AMP, Inc.	Harrisburg, Pa.	6-10	$3,000	10% increase	100%	yes
6.	Caterpillar, Inc.	Peoria, Ill.	6-10	$2,460	15% increase	90%	yes
7.	Bay Networks, Inc.	Santa Clara, Calif.	11-15	$5,000	10% increase	80%	yes
8.	Honeywell, Inc.	Minneapolis	6-10	$3,000	5% increase	90%	yes
9.	Caliber Technology, Inc.	Akron, Ohio	6-10	$2,400	5% increase	90%	yes
10.	Tech Data Corp.	Clearwater, Fla.	more than 20	3-5% of compensation	20% increase	100%	yes
11.	Capital One Financial Corp.	Falls Church, Va.	11-15	$3,200	increase (%NA)	100%	yes
12.	Xerox Corp.	Rochester, N.Y.	6-10	$8,600	remaining the same	100%	yes
13.	Minnesota Mutual Life Insurance Co.	St. Paul, Minn.	11-15	$3,022	15% increase	100%	no
14.	First of America Bank Corp.	Kalamazoo, Mich.	6-10	NA	10% increase	100%	yes
15.	Sears, Roebuck and Co.	Hoffman Estates, Ill.	11-15	$7,500	remaining the same	100%	yes
16.	J. B. Hunt Transport Services, Inc.	Lowell, Ark.	6-10	$1,200	20% increase	90%	yes
17.	Compaq Computer Corp.	Houston	6-10	$2,000-$2,500	10% increase	100%	yes
18.	International Paper Co.	Memphis	11-15	$2,820	5% increase	65%	yes
19.	Reynolds Metals Co.	Richmond, Va.	11-15	$700	8% increase	90%	yes
20.	McDonald's Corp.	Oak Brook, Ill.	11-15	$1,800	9% increase	95%	yes
21.	Unum Corp.	Portland, Maine	6-10	$3,000	10% increase	80%	yes
22.	Computer Task Group, Inc.	Buffalo, N.Y.	6-10	$934	25% increase	100%	yes
23.	Owens Corning	Toledo, Ohio	11-15	$2,500-$4,000	remaining the same	100%	yes
24.	ITT Corp.	New York	more than 20	$5,000	remaining the same	100%	no
25.	Northwestern Mutual Life Insurance Co.	Milwaukee	6-10	$1,200	10% increase	85%	yes
	Survey averages (of the top 25 total employers)		11.84 days	$4,421.13	10.7% increase	93.8%	92%

Source: Computerworld's 1997 Annual Best Places to Work & Best Companies for Training Survey (NA=Not available)

skills. CA believes in developing well-rounded technicians. As a result, technical employees are cross-trained to build, sell and install products at customer sites. They also answer customers' questions about products over the telephone. Technical staff rotate through all of those areas and are available to fill in as needed.

To support cross-training, CA employees take classes on the latest technologies and on the soft skills necessary for customer contact. "We teach them how to listen to the customer and how to solve real problems [for customers]. We also teach writing skills," says Richard Chiarello, a senior vice president and general manager at CA.

SOFT SKILLS ARE IMPORTANT

CA believes such well-rounded technicians are best able to meet customers' needs. IS employees agree. During job interviews, "[candidates] always want to know what kind of soft-skill training they will get," Chiarello says.

Training at CA begins on an employee's first day. Recent IS college graduates take an eight- to 12-week training course to learn about CA's business philosophy, technical platforms and the basics of customer contact. Even if new hires have a wealth of technical experience, they still get trained in CA's strategic business vision, existing technical platforms and communication and business skills.

"Talented people who are happy are going to have a hard time not having a good career," Chiarello says.

Like CA, The Home Depot, Inc. in Atlanta believes IS employees need to understand their customers — not only the retail customers but also end users. To do that, IS employees need to be well-grounded in basic business concepts and the retail environment.

"Once you have mastered those concepts, then you have increased your value. Those people are able to take on more and assume more responsibility and, consequently, we will pay them more," says Ron Griffin, senior vice president of information services at Home Depot.

For example, the retailer hopes to offer IS employees a mini-MBA course this summer. "We have identified 20 concepts that you are likely to get in graduate school," Griffin says. The concepts in the MBA course include calculating net present value, amortizing computer hardware and building customer loyalty.

Home Depot also stresses in-store experience. All IS employees, within their first several months at the company, spend a week working in a Home Depot store. Many of them work shifts during the Christmas season.

No matter the specifics of each training program, the companies that made *Computerworld's* top 25 training list know that a strong training program benefits both employer and employee. They also know that training is an evolving process that requires a long-term commitment from employer and employee. As Chiarello says: "I've been in this business 18 years, and I am still going to training." □

Wilson is a freelance writer in Glen Ellyn, Ill.

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OF TRAINING PLAN			NUMBER OF COURSES OFFERED TO IS EMPLOYEES IN PAST TWO YEARS							
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yes	yes	yes	10+	10+	5+	5+	2+	2+	5+	varies
yes	yes	yes	157	5	6	4	2	4	21	$2,500-$5,000
yes	yes	yes	70	6	21	14	12	5	15	$10,000 plus
yes	yes	yes	20	4	4	1	4	4	8	$10,000 plus
yes	yes	yes	306	6	63	61	0	7	133	$10,000 plus
yes	yes	yes	292	6	6	4	2	3	11	$10,000 plus
yes	yes	yes	10+	2	3	4	0	10+	5+	$5,000-$10,000
yes	yes	yes	75	3	6	23	7	14	5	$5,000-$10,000
yes	yes	yes	125	15	30	15	10	15	30	$10,000 plus
yes	yes	yes	20+	2	2	2	2	1	NA	$2,500-$5,000
yes	yes	yes	125	40	40	40	50	15	0	$10,000 plus
yes	yes	yes	175	7	6	45	9	3	65	$10,000 plus
yes	yes	yes	155	9	10	5	3	3	5	$2,500-$5,000
yes	yes	yes	NA	6	3	3	3	4	5	$10,000 plus
yes	yes	yes	250	15	45	45	9	15	25	$1,000-$2,500
yes	yes	yes	77	12	5	9	0	12	11	$5,000-$10,000
yes	yes	yes	50+	4	3	4	2	3	1	$5,000-$10,000
yes	yes	yes	125	10	5	5	3	2	40	$1,000-$2,500
yes	yes	yes	40	3	1	1	1	2	6	$10,000 plus
yes	yes	yes	200	1	5	20	5	5	many	$5,000-$10,000
yes	yes	yes	50	2	2	4	2	2	2	$2,500-$5,000
yes	yes	yes	275	23	5	2	2	4	8	$2,500-$5,000
yes	yes	yes	12	3	6	1	1	2	2	$10,000 plus
yes	yes	yes	100+	NA	NA	NA	NA	NA	NA	$10,000 plus
yes	yes	yes	40	13	15	3	2	3	15	$5,000-$10,000
100%	100%	100%	118	9	12	13	6	6	18	$7,070

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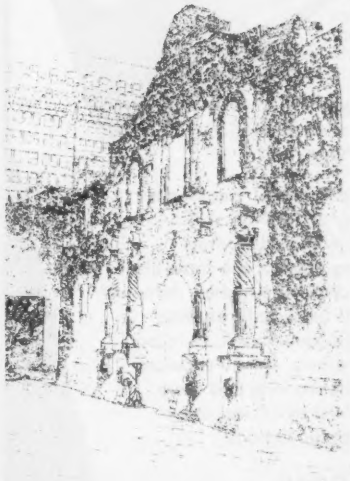

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Project Engineer. Serve as technical leader and project coordinator for Latin American Data Acquisition and Control projects. Define project specifications: prepare bid packages. Use DSP techniques in C/C++ to design / develop PC-based and HP-UX-based real-time control and data acquisition systems.Design/develop UNIX networked systems using the TCP/IP and UUCP protocols for telemetry related projects. Develop GUIs using Object-oriented techniques with C++, OSF/Motif. B.S. in Electrical Engineering or related required; two years experience in job offered or as Electrical Engineer required. Education and/or experience must include project management; UNIX IPC; TCP/IP programming using Berkeley sockets and System V TLI; OOA/OOD/OOP (C++); X Window System programming with Xlib, Xt Intrinsics, OSF/Motif widget set. Must be fluent in Spanish. 40 hours/week; 8:00 a.m. to 5:00 p.m. Salary is $45,968 per year, $22.10 per hour overtime.Send resume to Janice Lowell, P.O. Box 44705, 2441 Production Drive, Indianapolis, Indiana, 46244-0705.

COMPUTERWORLD
FALL Campus Edition

Issue:
October 31, 1997

Advertising Deadline:
September 17, 1997

Data Base Design Analyst, 40hrs/wk,9:30-5:30, $43,000/year. Analyze, design & implement data bases. Create applications and user interfaces that will allow users to manipulate relational databases. Create new databases or manipulate existing ones to meet client specifications and needs. Update definition of data in data dictionary. Design & implement GUI (Graphical User Interface). Details how data is to be accessed in program. Tools used: UNIX, SAS, SQL/Oracle, Visual Basic, Delphi, MS Access, and ObjectView. Requires MS in Data Analysis or Computer Science and 10 months experience as Data Base Design Analyst. Must have proof of legal authority to work permanently in the U.S. Send 2 copies of both resume & cover letter to: Illinois Department of Employment Security, 401 South State Street - 3 South, Chicago Illinois 60605, Attention: Shella Lindsey, Reference #V-IL 18155-L. NO CALLS. An employer paid ad.

SENIOR COMPUTER ANALYST - Analyzes and evaluates existing or proposed systems and devises computers to process data. Prepares charts and diagrams to assist in problem analysis and submits recommendations for solutions. Prepares detailed program specifications and flowcharts, and coordinates the system's installations with user department, ensuring satisfactory results. Bachelor's Degree in Computer Science or Computer Science Engineering. Must have at least three years of experience in IBM, mainframe TSO and ISPF, FOCUS, Lan Server 3.0, Novell and mainframe JCL, PSS, MVS, VM, and Cobol. 40hrs/wk, 8-5, $46,000/yr. Must have proof of legal authority to work in the United States. Send resume to the Iowa Workforce Center, 800 Seventh Str. SE Cedar Rapids, Iowa 52406. Job # IA1100593. Employer Paid Ad.

1-800-343-6474, x8000

Database Analyst: Designs, creates, develops, modifies, and implements an Oracle based Internet WWW database informational server system to insure data and communication transfer accuracy. Modifies and performs compatible programming of databases to allow system access by multihome web servers including Netscape and HTTPd servers. Performs associated system and network troubleshooting including installation of appropriate FireWalls. Adapts database system for use in Windows 95, Windows NT, Solaris, and Mac operating systems. Requires M.S. Degree in Computer Science. Also requires six months experience in the job to be performed or six months experience as a Systems Administrator. If experience in related field, entire experience must include the installation and configuration of a Windows NT and Solaris operating system on a networked environment including designing and implementing of an Oracle relational database system. Education to include completion of one project in the development of a client/server based interface for data warehousing and one project in implementing a Web-Oracle-Web homepage using HTTPd and Netscape. $40,000/yr; 40 hrs. week, 9:00 AM to 5:00 PM. Two copies of resume to: Mike Brooks; JETS-ALC, P.O. Box 7972; Madison, WI 53707-7972. Please reference case number C100077.

PROGRAMMER ANALYST - Research, design and develop software in conjunction with hardware product development, for clients. Apply principles and techniques of computer science, engineering, and mathematical analysis. Analyze software requirements to determine feasibility of design with time and cost constraints. Consults with hardware engineers and other engineering staff to evaluate interface between software and operational and performance requirements of overall system. Develop and direct software systems and testing procedures programming and documentation. Consult with customers concerning maintenance of software systems and coordinate installation of same. Bachelor's Degree in Computer Science, Computer Application or Engineering. Requires one year experience in IBM PC XT/AT, IBM PS/2 Macintosh, UNIX OS/2.2X, OS/2 Warp MS-DOS, Windows 3.x Windows 95 and Macros C, REXX, FORTRAN 8086 & 68000 ASSEMBLER, Power Builder, FoxPro, Lotus Notes Ms-Excel, Ms. Word. 40hrs/wk, 8-5, $50,000/yr. Must have proof of legal authority to work in the United States. Send resume to the Iowa Workforce Center, 800 Seventh Str. SE Cedar Rapids, Iowa 52406. Job # IA1100594. Employer Paid Ad.

DIRECTOR, COMPUTER SERVICES

Douglas County is seeking a highly motivated manager to lead the Computer Services Division. Applicants must possess a B.S. degree, have extensive knowledge of both mainframe and personal computer programming and utilization,be familiar with COBOL and CICS,be aware of new technology and its application, and have excellent communication and people skills. Job description is available upon request. Salary will be based upon experience.Submit resume and required beginning salary range by Wednesday, April 30, 1997 to Pamela J. Madl, Director of Administrative Services,Douglas Courthouse,1100 Massachusetts, Lawrence, KS 66044.
EOE

Software company seeking Computer Programmer for software systems design and improvement design, coding, testing and documenting applications; Programming in Delphi, Object Pascal for POS peripheral devices interface design.$532/week.40 hours/week (8:00 to 5:00). Requirements: High school diploma; B.S in Computer Science or related discipline; 9 months of experience in Object-oriented programming; 6 months of Computerized Inventory Control experience. Include Social Security # and employer I.D. 3450417 and send along with resume to: Indiana Department of Workforce Development, 10 N. Senate Ave., Indianapolis, IN 46204-2277 Attn. Gene R. Replogle.0

MANAGEMENT INFORMATION SPECIALIST 6
NETWORK TECHNICAL SUPPORT SPECIALIST

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

The State Department of Natural Resources is searching for a Technical Support Specialist to serve in the Bureau of Enterprise Information Technology and Applications. This position is one of a team of technical staff that designs and supports the state of the art network servers. The environment includes Digital Alpha and Intel servers operating OPEN VMS, Unix and NT. The DNR has standardized on Oracle, MS Exchange, and MS Office. Duties include assisting in the design of Network services, installing and maintaining operating systems, troubleshooting technical situations, installing fixes, and advising developers in in the design of applications.

STARTING SALARY and BENEFITS: Starting salary between $36,124 and $45,516 per year, depending on qualifications. In addition, the state offers health, dental, life and income continuation insurance, a comprehensive retirement program including State contributions, tax deferral programs for health costs, home care costs and retirement and a leave program consisting of vacation, personal days, Holiday leave, and accumulating sick leave. The position is located in Madison, Wisconsin rated no 1 the city in the country.

QUALIFICATIONS: Well qualified applicants will have at least five years progressively responsible experience in support of a complex network environment that includes one or more of the named operating systems, experience with programming languages in an Applications Development setting and project management in a technical support environment.

HOW TO APPLY: For special application/examination materials, please call (608) 266-2274 and select Option 3; or write Curt Awve, DNR Human Resources Office, P.O. Box 7921, Madison, WI 53707. Completed application/examination materials must be received in the DNR Human Resources Office by April 14, 1997.

Consultant/Oracle Programmer to develop Vehicle Reliability D/base residing on HP-Unix platform & client server network; design Oracle d/base from ground up including complete d/base installation, backups, administration, tuning of Unix server & securing d/base; analyze changes, troubleshoot & conduct orientation sessions to end users; administrate developed d/base; write Unix shell scripts for automating d/base process; install & configure SQL*Net 2.2, SQL*Loader & PL/SQL; develop forms, queries & reports from d/base using MS-Access front end GUI connecting to Oracle back-and thru SQL*Net connecting thru ODBC; develop automatic process of loading SAS tables onto Oracle d/base tables in Unix thru TCP & SQL*Loader; write Pro*C codes to access d/base over entire network; Reqs. Masters in Comp. Sci., Computer, Electrical or Electronic Engg., 6 mos exp in job offered or 6 mos related exp such as System Admin. or Programmer. Related exp must include, in whole or part, design, analysis, implementation, testing & documentation of d/bases using client server network, SQL*Form, Pro*C, PL/SQL, Oracle, SQL*Plus, SQL*Net, installing & troubleshooting h/ware systems; $23.22/hr, $34.83/hr OT, 40 hrs/wk, OT as req'd, 8a-5p. Send resume to 7310 Woodward Ave., Room 415, Detroit, MI 48202. Ref. #155796 "Employer Paid Ad"

Computer engineers: Develop, install & maintain routine testing h/w & s/w for vehicle interior noise measurement & assessment; interior harmony assessment, usability evaluation of interior products, seat suspension; operate 4-D vibration shaker, digital sound measurement device; design A/D, I/O interface & real time data acquisition; use DSP micro controller, PC controller. Req: BS or 3yr college+5yr exp; 3yr exp in job offered or related as eng; related exp include h/w & s/w application. 40 hr/wk, 8-5pm. Competitive salary. Send resume to RCO Engineering, Inc., 29200 Calahan, Roseville, MI 48066. Attn: Clifford R. Weyhing.

Senior Systems Analyst (Evansville, Indiana). Design, analysis and development of application computer system written in COBOL 400 using iRPG/400 and ILE/RPG under OS/400 for deployment on AS/400 hardware. 40 hrs., M-F, $60,000 per year. Requires: Master's in Comp. Sci., Comp. Engineering or MIS plus 2 years experience in job or in the alternative Bachelor's in aforementioned subject plus 5 years professionally responsible experience in job duties. Send resume to Marie L'Esperance, #301, 675 Third Avenue, 21st Floor, New York, NY 10017

SAP CONSULTANT (APPLICATION SYSTEMS ANALYST SENIOR) - Oakbrook Terrace, IL.: Utilizing business knowledge of the production industry, instruct & mentor lower level systems analysts in the use of configured systems; Analyze & document customer requirements for implementation & integration of SAP (Systems Applications & Products in Data Processing) modular computer software system utilizing paper w/ materials management. Propose solutions to Lead level Systems Analyst. Analyze & propose use of SAP in business solutions directly to the client; Configure tables to ensure proper transactional functionality & integration w/ other modules. Bachelors Degree in Comp. Science, Engineering, Management, Math, or Info. Tech. required. Employer will consider a degree in any field plus 1 yr. of work exper in materials or warehouse management as sufficient to satisfy the degree requirement. Must have 1 yr exp. in job offered or 1 yr. exp. as SAP Consultant or Analyst. The 1 yr exp must incl. SAP materials management. Employer will accept 6 mos of SAP training which included materials management in lieu of the exper. requirement. $52,000/yr, 40 hrs/wk, 9:00 - 5:00. Must be willing to relocate to worksites w/in the Midwest region. Must have proof of legal authority to work in the U.S. Send 2 copies of both resume & cover ltr (no calls) to: Illinois Department of Employment Security, 401 South State Street - 3 South, Chicago, Illinois 60605 Attn: Janet Aschenbrenner Reference # V-IL 15920-A. This is an employer paid ad.

SAP ABAP CONSULTANT (App. Sys. Prog. Senior) - Oakbrook Terrace, Illinois; Program & create technical design documents from business specifications utilizing knowledge of ABAP/4 programming language & Data Dictionary in SAP (Systems Applications & Products in Data Processing) modular software. Design customer reports in functional area of focus including sales & distribution, materials management & financial software. Mentor & instruct junior level programmer & consultants. Bachelors degree in Comp. Science, Math, Engineering, or Info. Technology required. Must have 1 yr exp. in job offered or 1 yr. related exp. as Consultant, Analyst or Programmer. The 1 yr. must incl. 6 mos. SAP ABAP/4 Programming language, Data Dictionary, Materials Management, Sales & Distribution & Financial software. $73,000/yr., 40 hrs/wk, 9:00-5:00. Must be willing to relocate to worksites w/in the Mid-Western Region. Must have proof of legal authority to work permanently in the U.S. Send 2 copies of both resume & cover ltr (No Calls) to: Illinois Department of Employment Security, 401 South State Street - 3 South, Chicago, Illinois 60605, Attn: Joan Sykstus, Reference # V-IL 16447-S. This is an employer paid ad.

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Programmer/Analyst, Tucker, GA and various client locations in GA: Design/develop/test client/server applications in UNIX & SCOS environment using Oracle, SQL*Plus, PL/SQL, Pro*C, Korn Shell Scripts, IMAKE & AWK. GUI development using Power Builder & PVCS. Review & analyze completed softwares on multi platform AIX, UNIX, Solaris, using Debuggers. Provide system support & troubleshoot problems. Bach. in computer science or engg+2 yrs experience in job or 2 years exp as a computer/programmer analyst or software engineer; related occupation must include 1 year experience in above specified duties. $57,000/yr-40 hrs/wk. Send resume in duplicate to Georgia Department of Labor, Job Order # GA 6081444, 3879 Covington Highway, Decatur, GA 30032 or the nearest Department of Labor Field Service Office.

Software Engineer, Pompano Beach, FL and other client locations: Analyze, design, develop, implement, enhance and modify commercial software applications and databases in an IBM mainframe environment. Test applications, databases and systems integration. Train users and provide documentation as necessary. Req'd Master's degree in comp. sc., physical sciences, engg. (any field) or MBA and 3 yrs. in the job duties or in commercial software development. 2 yrs. of the exp. must be with CICS, DB2, IMS DB or IMS DC, COBOL & IBM management and productivity tools (e.g. XPEDITER, INTERTEST & ADW). All the exp. may be concurrent Master's degree may be substituted by a Bachelor's degree in comp. sc. or comp. sc. engg. & 2 add'l yrs of exp. in the job duties. M-F 8:00am-5:00pm. 40hrs/wk. $54,000/yr. Must have proof of legal authority to work in the United States. Send resume in duplicate to: Job Service of Florida, 2660 West Oakland Park Blvd., Fort Lauderdale, FL 33311-1347. Re: Job Order number FL-1573715.

VP Product Development

OLTP system provider. Architecture, application software, design & manuf. of terminals, custom modifications, installation and software maintenance.

Send resume to PTI#3 at info@paulturn.com, or fax: 972-702-7521.

Systems Engineer - Duties include the design of computer systems for industries, banks and major corporations in Latin America. Approximately 5% of the year involves business travel to Latin America. 40 hours per week, 9 A.M. to 6 P.M., Monday through Friday. Must have Bachelor of Science and Systems Engineering and two years of work experience as a Systems Engineer. Please submit resume to Department of Labor, Bureau of Operations, 1320 Executive Center Drive, Atkins Building, Room 110, Tallahassee, FL 32399-0667. RE: Job Order No: FL-1574813.

SOFTWARE ENGINEER Seeking Software Engineer for employment recruitment, placement and leasing firm. Requires a Master of Science in Engineering or Computer Science and prior knowledge, consisting of two semesters of coursework or 12 months of work experience, in each of C and C++ programming languages, object-oriented programming techniques, and UNIX operating environment. Employee will be responsible for the analysis, design, development and testing of object-oriented systems and test software for a UNIX-based environment in compliance with CMIP protocol suite utilizing C, C++, and object-oriented programming languages. Employee will also be responsible for the design of test cases to verify software. 40 hrs./wk. $48,840/yr. All resumes must include the applicant's Social Security Number. Apply Job Service, 742-F East Chatham Street, Cary, NC 27511, or nearest Job Service office. Be sure to reference Job Order Number NC5761051 and DOT Code 030.062-010.

SOFTWARE ENGINEER to design, develop, analyze, test and implement management and manufacturing systems using GUI tool PowerBuilder and Object Oriented methodology in a Windows, DOS and UNIX operating systems with Oracle, Sybase as Relational Database Management Systems (RDBMS) with programming languages C and SQL in a Client/Server environment. Require: M.S. in Civil Engineering or Computer Science and two years experience in the job offered or as Software Developer or Programmer/Analyst. Experience must include at least one year each in Client Server technology, RDBMS, GUI development using PowerBuilder and Sybase, Oracle and SQL. Must be a Certified Power Builder Developer. Salary: $52,000 per year, 8 am to 5 pm, M-F. Mail resume in duplicate to: Georgia Department of Labor, Job Order # GA 6078583, 2943 N. Druid Hills Road, Atlanta, GA 30329-3909 or the nearest Department of Labor Field Service Office.

Software Engineer, Megaswitch System: Design & develop customer support information systems global telecommunications network. Analyze systems requirements & implement engineering procedures by utilizing experience in Type B, X400/edi, MCS/MSS, and MSW messaging systems, UNIX/XENIX/SCO UNIX/interactive UNIX/SUN operating systems; LAN/WAN networks; TCP/IP, CB 012 P1140, CB 10140 X25, P1024, and SNMP protocols; SITASCOPE/ATOM monitoring and programming tools, SITATEX/TRANDISP/TRANRTB/FILT/CONF/FP/EMU programs; ISM software, C/Assembly languages, messaging systems high availability control. Rqmts. BS in Electrical Engineering, 4 yrs. exp. in job offered or as Systems Analyst with exp. identified above. 40 hr/wk, M-F, 8:30-5, $49,754/yr. Apply in person or send two resumes to: Georgia Dept of Labor, Job Order # GA 6079693, 465 Big Shanty Rd., Marietta, GA 30066-3303 or the nearest Dept. of Labor Field Service Office.

SOFTWARE ENGINEER to design, develop, analyze, test, implement, maintain and support financial database applications for telecommunication industry clients using Sybase Open Client/Open Server DB Library on UNIX/Windows NT operating systems (stand-alone and networked) with TCP/IP network protocol. Also utilize C and C++ programming languages and shell scripts such as Awk with Visual Basic on the front-end in a client/server environment. Require: B.S. degree in Computer Science with two years of experience in the job offered or in the related occupation of Programmer. Extensive paid travel (40%) to client sites within the U.S. Salary $48,000 per year, 8 am to 5pm, M-F. Apply by resume to: Michelle Grandstaff, Compaid Consulting Services, 7840 Roswell Rd., Ste. 320, Atlanta GA 30350. Attn: Dept. PD.

Software Support Consultant. (Atlanta). Install, customize and support Maestro II. Design, test, and modify code. Network design. B.A. in Computer Science, Eng. or equivalent. 2 yrs experience with Maestro II; Prolan and client/server architecture. $72,000/yr. 40 hrs./wk. Must have proof of legal authority to work in the U.S. Send resume in duplicate to: Angus MacLeod, Softlab, Inc., 1000 Abernathy Road, Suite 1000, Atlanta, GA 30328.

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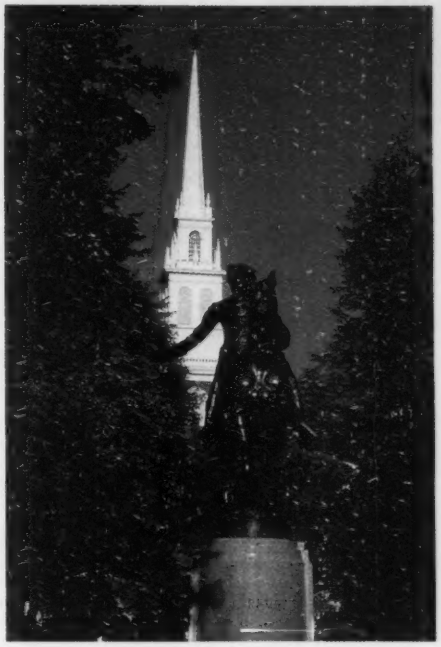
IS hiring managers in Boston are up in arms over record-high costs for, and shortages of, qualified recruits

By Lynn Haber



CONSIDERED ONE OF THE TOP 5 job markets in the country, Boston is known for its cold winters. But this season, it's proving to be one hot town for IS professionals.

Jobs abound for information systems professionals with a few years of hands-on experience in current technologies and platforms such as client/server, networking/communications and World Wide Web technology. Job listings recently filled more than 125 pages in the Sunday edition of *The Boston Globe*, the city's most widely read newspaper.

The state boasts an unemployment rate of 4.1%, well below the national average of 5.3%, according to the Massachusetts Department of Employment and Training. By 2005, the state expects to generate 374,000 new jobs — half of them in the Boston area. IS occupations with the fastest growth include systems analysis, computer engineering and computer service technology.

USING EVERY AVENUE

Mike Walsh, vice president of technology staffing at State Street Bank and Trust Co., says he expects to have 500 job openings this year. Like other area employers, Walsh uses any and all avenues for recruiting, including newspaper ads, agencies, online listings, job fairs, college recruiting and an employee referral bonus program. "This is the tightest market I've seen in 20 years," he says.

State Street is hiring IS professionals — from entry level to senior management — in areas such as client/server computing, Unix, LAN/WANs and intranet and Internet-based networking. Specific skill sets in demand include Powersoft's PowerBuilder, graphical user interfaces, C++, Sybase, Inc. databases, three-tier architectures, object-oriented design, Windows 95 and Windows NT, Java and Hypertext Markup Language.

One of the most difficult positions to fill is for Sybase database administrators. "I'd give my eyeteeth for a Sybase [database administrator]," says Jan Shipe, a senior staffing officer at State Street.

The financial services industry in Boston is scorching hot for IS talent. Area recruiters have seen a migration in this industry go up the eastern seaboard from New York to Boston. The growth of the financial services sector has picked up in the past five years, taking up the slack left by a withering minicomputer industry that included players such as Digital Equipment Corp., Wang Laboratories, Inc. and Data General Corp.

Not only do employers lament the tight supply of job candidates, but they also must deal with bidding wars that drive up salaries. "We're competing with every other area company for people with client/server, Unix, Java, C++, Visual Basic and Windows tools skills," says Paula Merageas, a human resources representative at Thomson Financial Services Corp.

Merageas wouldn't say how much more Thomson is paying IS job candidates, but she says negotiating is more intense between the company and new hires for salary and benefits. The company also is expanding its comprehensive benefits package. The company last year revamped its employee referral program, offering as much as $5,000 for a lead that results in a hiring.

Demand for IS professionals in the Boston area is so fierce that employment agencies say they have had to turn away business. Winter, Wyman & Co., a Boston employment agency, had enough IS job offerings on its plate. The agency stopped dealing in the mainframe talent arena three years ago, despite the strong demand for workers with mainframe skills to maintain legacy systems and for candidates to handle year 2000 conversion projects.

Top IS professionals are negotiating with potential employers for private school tuition for their children, and then taking it a step further: They are opting to be consultants rather than full-time employees. This leaves a gaping hole in an already thin supply channel.

Companies offer salaries from about $30,000 for an entry-level programmer to $70,000 for an Oracle database administrator and more than $200,000 for senior IS managers. Independent consultants with prime skills are making up to $250 per hour in the region. □

Haber is a freelance writer in Norwell, Mass.

BETTER BY THE NUMBERS

IS salaries are generally higher in Boston than the national average

JOB	BOSTON SALARY	NATIONAL SALARY
CIO/vice president	$106,000	$96,000
Director, systems development	$82,000	$74,000
Client/server project manager	$64,000	$61,000
Senior systems analyst	$57,000	$54,000
LAN manager	$53,000	$47,000
Technical support manager	$48,000	$44,000

Source: *Computerworld*'s 1996 Annual Salary Survey

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As the recognized leader in managed care, Tufts understands the value of technology and training required to maintain technical proficiency. The company also believes in enpowering its employees to deliver exceptional customer service and quality of care. To be part of a winning IS team, look into these opportunities:

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- **Application Project Leaders**
  (Experience and/or Familiarity with Two or More of the following): COBOL; PowerHouse; Lotus Notes; Visual Basic; SQL; EDI; UNIX
- **Sr. Systems Analysts**
  Mid to large-scale systems, client server systems, UNIX-based systems
- **Sr. Network Engineers**
  LAN/WAN, Routers, Switches, IP, IPX & FDDI Protocols, Network Analyzer, ATM, Nortel Option 81, IVR, CTI, VMX Vmail
- **Technical Project Leader**
  (Hands-on Experience with Two or More of the following): HP3000, HP9000/UNIX, Internet, Client Server, Project Management
- **Database Administrator**
  (Any of the following): SQL, MUMPS, IMAGE, ORACLE
- **Sr. Systems Engineer**
  Server Installation, Maintenance, Configuration; Netware 4.X, Windows NT 3.5X or 4.X; CNE and/or MCSE
- **Software Control Analyst**
  (Experience and/or Familiarity with Two or More of the following): HP3000, HP9000/UNIX, Security, Software Installation, Documentation
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- **Data Center Manager**
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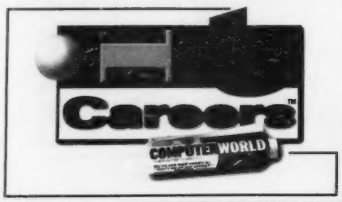

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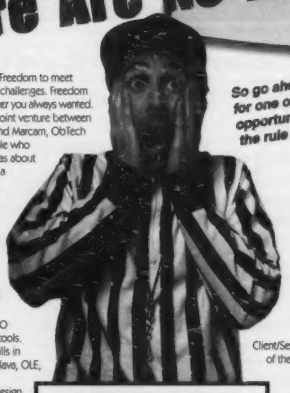
At ObTech™, the upstart start-up that focuses on object-oriented technology implementation, integration, interface, and consulting services, we're going to give you the freedom you've been looking for.

ObTech Rule #1
There Are No Rules!



Freedom to excel. Freedom to meet crucial technology challenges. Freedom to develop the career you always wanted. Formed through a joint venture between NEC Corporation and Marcam, ObTech is looking for people who have their own ideas about what it takes to be a technology leader.

So go ahead and apply for one of our incredible opportunities - just leave the rule book behind.

Technical Pre- and Post-Sales Consultants
Direct hands-on experience with OO programming and tools. Strong technical skills in C++, Visual Basic, Java, OLE, ODBC, Database Architecture and Design, and/or in-depth experience with NT, Unix, RDBMS, CORBA, IIOP, and message oriented-middleware (*tlr* or p/s). Experience in OOA/OOD methodologies desired.

Industry Post-Sales Business Consultants
Experienced, confident and functional experts in manufacturing, supply chain, or financials. CPA, CMA,MBA or CPIM, experience in Client/Server and one or more of the following industries: **pharmaceutical, chemical, consumer products, plant maintenance, or food and beverage.** Project management skills are essential.

Preference will be given to those individuals with experience in Protean, BPCS, SAP, PeopleSoft, and PRISM. Get on the right career track with ObTech.

Send your resume or letter describing your qualifications to:
Kelley Joyce, ObTech LLC, 95 Wells Avenue, Newton, MA 02159. Fax 617-630-0982.
E-mail kelley.joyce@obtech.com
No phone calls or agencies please. *An equal opportunity employer*

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Hewlett-Packard Medical Products Group in Andover, MA, is the leading provider of patient monitoring systems, cardiac ultrasound imaging, and clinical information systems for critical care units worldwide.

Information Technology Engineering Consultant
Act as the technical leader on client/server application development teams involved in architecture development efforts as you evaluate new technologies and determine effective use and deployment of them. To qualify, you must have a BSCS or SE, or a BS in an engineering-related field with 10 years of application design and development experience; a Master's is preferred. 10 years of experience in business solutions design, development and deployment using client/server platforms, database technologies, application development tools and Web application development required. Must have 8 years of application design and integration experience and 5 years of relational database experience. Oracle design/development experience is strongly preferred. **Job Code: 602988**

Information Technology Solutions Specialist
Our Medical Products Group is seeking an engineer professional to provide ongoing maintenance, enhancements and support for Oracle-based client/server solutions being developed by the Business Process Automation IT group. A BSCS or SE, or a BS in an engineering-related field required. Must have 5 years of experience in business solutions development and deployment with 2 years of client/server development experience using Windows, NT and/or HP-UX, database technologies and application development tools. Relational database and UNIX development experience are essential. **Job Code: 609222**

Information Technology Solutions Specialist SAP Team
Develop extensions to the SAP application as well as development activities such as analysis, design, programming and testing. This position also develops interfaces, conversions and reports and acts as support for Web development. Applicants must have a BS in CS, IS, Business or Engineering. Your leadership and decision making skills are essential. Web development experience preferred. Some travel is required. **Job Code: 609224**

Information Technology Engineer
As an integral member of our Medical Products Group, you will be responsible for configuring the SAP application in the areas related to manufacturing and purchasing. Requirements include a BSCS, IS, Business or related field; strong leadership skills; excellent communication skills. Working knowledge of SAP is preferred. **Job Code: 609227**

Information Technology Engineer
In this technical leadership position, you will lead the strategic direction, development and implementation of workgroup technology for the Medical Products Group. You will act as the expert in groupware tools, methods and processes and you will investigate emerging Web groupware technologies such as Lotus Notes/Domino. To qualify, candidate must have a BSCS or equivalent coupled with 3 years of relevant experience; a Master's is preferred. Knowledge of groupware technology and of PC technology and its environment is required. Strong background in process and tools development is essential. **Job Code: 610295**

These positions are based at our Andover, MA facility. Candidates should forward resumes indicating Job Code and Event Code 5069 to: Personnel, Hewlett-Packard, 3000 Minuteman Road, Andover, MA 01810. Fax: (508) 687-2017. Email: resume@hp.com
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PC SPECIALIST
Associate's degree plus 3 years' microcomputer experience working with DOS, Novell, Windows and Win NT, or equivalent background. NT certification highly desirable.

SR. PROGRAMMER/ANALYSTS
BSCS or related degree required, with 3-5 years' programming, systems analysis, or applications development experience. Background in M, COBOL, FOCUS, or C++ programming a strong asset. IBM/VM mainframe, SQL experience, and/or familiarity with Warehousing and Internet desired. Healthcare experience a plus.

UNIX SYSTEM MANAGERS
Hands-on positions installing, maintaining, and supporting Digital's UNIX OS on Digital ALPHA platforms. BSCS or related degree and 5 years' programming experience, or Associate's degree with equivalent background. Knowledge of 4 programming languages, database systems, operating and teleprocessing systems, and communications essential.

Send resume and cover letter with salary requirements to: DHMC, Code CW, Attn: Employment, One Medical Center Drive, Lebanon, NH 03756. Fax: (603) 650-5012 or email: dana.yuncaitis@hitchcock.org (please use MS Word 5 format). Equal Opportunity Employer M/F/H/V. Website: www.hitchcock.org

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Today, we invite you to discover for yourself what kind of impact Motorola can have on your career by joining us in one of the following positions:

Oracle Database Administrator
Responsibilities include technical support for the Oracle Database Management Systems. You will monitor the performance of database and make appropriate tuning adjustments, upgrade to new revision levels and recommend future directions, and work with user department to coordinate system changes and implementation of new requirements. Classical duties: user and security administration, space and memory management, disaster recovery planning and performance monitoring.

Qualified candidates must have a willingness to work flexible hours; a minimum of 7+ years experience; a BS Degree in Computer Science or Engineering. Masters preferred; and knowledge of UNIX and Oracle database. We prefer a candidate with Detail understanding of Database Management Systems, particularly Relational Databases, and experience with Clarify Systems and client server development model. Knowledge of HP and DEC Alpha platforms is a plus.

SAP Applications Project Lead
This position is responsible for the development, implementation, and support of SAP applications for Motorola's facilities in Mansfield, MA and Huntsville, AL. The ideal applicant should have strong skills in configuring and supporting applications for FI, SD, MM/PP, EDI conversions and application interfaces. Requirements also include experience in technical support with data conversion and applications integration. This position could be based in either Mansfield, MA or Huntsville, AL.

Intranet Application Developer
Our continued growth has created a need for an application developer to design and code CGI based applications. You will work with system analysts in defining and executing technical solutions for business automation needs leveraging WEB technologies. Duties include performing high level system design and analysis, as well as coding and testing of applications you develop. Additional responsibilities involve researching, recommending and implementing third party software solutions and technologies.

Qualified candidates must possess strong analytical skills, in addition to solid organizational and communication skills. This position requires a BSCS and 3-5 years of SW experience. You must have knowledge of and experience with UNIX shell, PERL, and C programming. Experience with HTTP, FTP, HTML, CGI and TCP/IP fundamentals is also needed. Familiarity with JavaScript, Java, C++, SQL, Oracle, Netscape and NT is helpful. An advanced degree and/or experience is a plus.

For immediate consideration, please forward your resume, indicating position of interest to: **Attn: Staffing Dept., CW324, Motorola ISG, 20 Cabot Blvd., Mansfield, MA 02048. E-mail: IZZ00001@email.mot.com. Fax: (508) 339-3752.** Creating a diverse workforce through equal opportunity. M/F/D/V.

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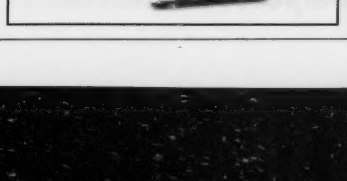

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Liberty Mutual I/S dedicated to effectively applying leading-edge technology to the development of business solutions for our customers and our company. We offer you a remarkable opportunity, one that can provide you with the challenges, growth, experience and lifestyle you are seeking.

Project Managers/Project Leaders

Coordinate the analysis, design, budget, technical resources and accuracy of I/T projects. Lead multiple projects involving data warehousing in an OO client/server environment (Sybase/DB2 preferred). Experience with Wintel desktop, mid-range, and/or mainframe systems preferred.

Client/Server & OO Developer

Design, develop, test and implement OO client/server systems. Experience with object oriented tools & methodologies (distributed objects and 3 tiered architectures) Visual C++, VB, MFC, CORBA, MQ, C++/UNIX, Booch/Rumbaugh, Jacobson, OMT, RogueWave, Snif+, Win95/NT, RS6000-AIX, HP-UX.

Database & Technical/Programmer Analysts

Data modeling, application development and support in an OO client/server, mainframe environment. Experience in one or more of the following areas: Win 95/NT, 4D, UNIX/Sybase, Cobol, or MVS/IMS/DB2. Data modeling tool experience preferred.

Software Test Leaders/Analysts

Assist in the development, implementation, and management of test plan activities for a release. Define test cases/scripts, recommend test tools, execute test analysis/debug and optimize performance. Experience with Purify, Pure Coverage or QA Partner preferred.

Business & Data Analysts/Architects

Structure and model shared data requirements and designs. Experience with data modeling, data flow and object modeling tools (Silverrun or Rational Rose preferred).

Desktop/Networks/Telecom Support Services

Implement and support desktop migration, inter-networking technologies and telecom systems utilizing the newest tools and technologies on Win 95/NT, RS6000-AIX, MVS mainframe systems. LAN/WAN, CSU/DSU, PBX experience preferred.

If you're ready to accept the challenges of one of the positions listed and change your lifestyle/workstyle for the better, send your resume to: **Bill Hickmott, Liberty Mutual I/S, 225 Borthwick Avenue, Portsmouth, NH 03801. Fax: (603) 431-0709.**

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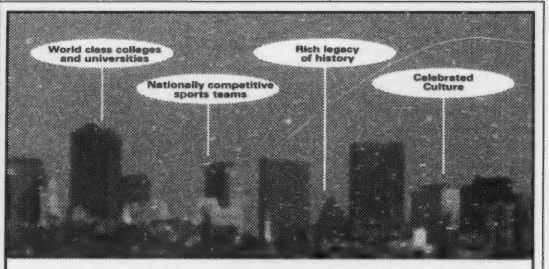

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Why come to KPMG? Right now, we have consulting opportunities available in areas ranging from finance to healthcare to manufacturing and distribution. If you're a Senior Consultant, you'll find that KPMG has the experience and expert staff that will enable you to take your career to new places. Maybe even to KPMG in Boston.

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- SAP/R3 IMPLEMENTATION CONSULTANTS (Code: SI)
- ORACLE IMPLEMENTATION CONSULTANTS (Code: OI)

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$15,000 Hiring Bonus for individuals hired into the Boston office between March 30 - June 30 with Big 6 experience in PeopleSoft, SAP and Oracle.

Resumes should be directed to: KMPG Consulting-P. Hardy, FAX: (617) 988-1814; Mail: 99 High Street, Boston, MA 02110; E-mail in ASCII format to: phardy@kpmg.com

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As an **Account Manager**, you will be responsible for consulting with existing customers regarding staffing issues and identifying and building relationships throughout New England or the Mid-South. As a **Technical Recruiter**, your priority would be to initiate and maintain relationships with our contract professionals who specialize in Information Technology disciplines.

Candidates should have technical sales or staffing experience, preferably within IT skill sets, a proven ability to develop and maintain consultative relationships, extremely high energy and a strong commitment to provide the highest level of quality customer service!

This is the opportunity you've been waiting for! Please submit your resume in absolute confidence to: **Tech Specialists, ATTN: LAR, One Corporation Way, Peabody, MA 01960. Fax: (508) 538-9558. E-Mail: lar@techspec.com**

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Because we're a full-service systems integrator, we can provide you with exposure to the full range of state-of-the-art technology. We are a Sun Microsystems #1 New England Reseller, Microsoft Solutions Partner, Novell Platinum Reseller, Oracle Integrator of the Year and a Hewlett-Packard Best of Class Reseller. Boston Business Journal named BSCG the #2 Largest Computer Business and VAR Business named us to their Honor Roll. High demand for our expertise has created the following outstanding opportunities at both our *Boston, MA* Headquarters and *Edison, NJ* facility for skilled professionals to share our success...

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Integration Engineering "IE"

About our IE Team:
Our IE team provides complex system & network integration solutions for our customers. As part of the IE team you will work closely with our Project Management team to design and install LAN/WAN and Unix based solutions. Our IE team is responsible for the design, specifications, installations, configurations, trouble shooting and testing of the hottest technologies in the market.

Opportunities:

- Sr. Unix Integration Engineers
- Sr. Microsoft Integration Engineers
- Staff Unix Integration Engineers
- Staff Microsoft Integration Engineers
- Staff Novell Integration Engineers
- Oracle DBA
- Systems Administrator- Supporting the State of New Hampshire
- Pre-Sales Engineers
- Field Service Engineers

Sales Opportunities

Sales

About our Sales Team:
Being a part of our aggressive sales team you will have the advantage of selling an entire suite of top-of-the-line products from premier manufacturers such as: Sun Microsystems, Oracle, Microsoft, Hewlett Packard, IBM and Cisco. Supported by our Pre-Sales Engineering team, you will have the best resources made available to you to have the capability to provide prospective, as well as current, customers the best system and network solutions

Opportunities:

- Oracle Financials Applications
- Account Managers
- Sr. Integration Account Managers

Along with the opportunity to participate in complex and challenging projects, being a part of our team will provide you with a competitive salary, benefits package and career growth potential. For immediate consideration in either Boston, MA or Edison, NJ, please send your resume and salary requirements along with the desired position to: Attn: Human Resources- ER, Bay State Computer Group, Inc., 52 Roland Street, Boston, MA 02129; Fax: 617-666-5966; or Email: aliciat@bscg.com.

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- Groupware Product and Applications Sales Professionals
- Groupware Product Manager with Lotus Notes experience
- Telephone Technical Support with strong Visual Basic and RDBMS experience
- Domino Developers

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Please forward all resumes to our corporate headquarters to
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Fax to: 617-588-0806, Email: jmarin@braintech.com
Check out our website at: www.braintech.com

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The members of Partners HealthCare System are collaborating on a future that puts the patient at the center of an integrated healthcare delivery system.

Opportunities are available throughout the Partners organization, including the Massachusetts General Hospital and Brigham and Women's Hospital.

Programmer Analysts

Provide maintenance and enhancement in the development of mainframe applications; MUMPS, COBOL, and clinical applications programming experience. **Job Code CW/91c/M0343**

Applications Analysts

Support computer applications with user community; IDX, decision support, laboratory systems and PeopleSoft experience. **Job Code CW/91b/M0479**

Network Administrators

Install, configure and troubleshoot large, multi-site network; experience in network administration and use of network management tools. **Job Code CW/91a/M5568**

Please send your resume, indicating appropriate Job Code, to Partners HealthCare System, Inc., 101 Merrimac Street, 5th floor, Mail Code M01518, Boston, MA 02114-4719; Fax: (617) 724-2266. We are actively seeking to increase the diversity of our workforce. EOE/AA.

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(ASCII text file only).
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SYBASE/RED BRICK DBA

Substantial experience in UNIX-based database support with Sybase, SQL Server, Oracle and Red Brick is critical to this position providing production support for key company databases including a new Data Warehouse initiative and worldwide client/server systems. Will also manage database configurations, performance tuning, and interface with other systems. The ability to communicate effectively with developers and create production support synergy among Technical Services is vital. BSCS or related degree essential; 5+ years' relevant experience required. **Job Code CB1-CW3/31**

LEAD BANYAN/NT NETWORK ENGINEER

Resolve escalated network trouble calls, coordinate installation and maintenance of network hardware and operating systems, and analyze data from network monitoring to improve service delivery. Will also review operating procedures and lead the analysis, design, project planning, coordination and implementation of networking solutions. Requirements include established leadership and/or supervisory experience, 6 years of related experience, and CBS (CBE preferred). Experience in LAN and/or WAN environments is crucial; solid working knowledge of both areas a must. **Job Code CB2-CW3/31**

SR. UNIX/NT SYSTEM ADMINISTRATOR

Provide production support for key company systems running in the HP-UNIX and NT environments. Help shape and design systems configurations to meet this area's growing needs. Will also be responsible for capacity planning, systems management, software installation, performance tuning, and connectivity. You'll need at least 3-5 years' related experience to qualify, with strong background in HP-UNIX system management and 1+ year's advance NT server experience. Ability to resolve hardware issues essential. BSCS preferred. **Job Code CB3-CW3/31**

AS/400 SYSTEMS MANAGER

Apply your solid troubleshooting and problem-solving skills in a 7x24 production environment providing daily production system support for several AS/400s running critical company applications. Will be responsible for performance monitoring, tuning hardware configuration, and overall system management. A BSCS or equivalent is required, as are 3 years of AS/400 system management and an in-depth knowledge of OS400, RPG, QUERY, and CL. Experience with solid work practices, including management and security, is essential. **Job Code CB4-CW3/31**

PC PHONE SUPPORT SPECIALIST

Flexibility, reliability, and a talent for teamwork are key qualifications for this multi-faceted role. Provide technical PC software/hardware and network support to both laptop and desktop users. Resolve network connection, printer, and configuration issues as well as hardware failures and application conflicts. We're looking for an Associate's degree or equivalent, 1-3 years' related experience, a commitment to customer satisfaction, and strong communication skills. Knowledge of MS Office, Win. 3.1 and 95 a must; NT or Banyan experience a plus. **Job Code CB5-CW3/31**

PROCESS IMPROVEMENT ANALYST

The chosen individual will have proven experience leading and facilitating major process improvement initiatives within midsize and large organizations. In addition, the ideal candidate will have a minimum of 2 years' external consulting experience in one or more of the following areas: Process Improvement and Redesign, IT Requirement Definitions, TQM, Change Management, Organizational Change. The candidate must have first-class facilitation and project management skills, and be able to work effectively at both executive and group leader levels. 5-7 years of relevant experience required, MBA preferred. **Job Code LB1-CW3/31**

TECHNICAL SUPPORT/SR. SOFTWARE SPECIALIST

The seasoned professional we seek will provide in-depth technical expertise on diverse software operating systems for pre- and (primarily) post-sales support. Tackle the "tough ones" as you evaluate unusually complex software requirements and consult with customers to resolve networking SW implementation issues. Requires a BS or equivalent in an allied science, 3+ years' as an IBM systems programmer/engineer in support of storage systems, and 5+ years' data processing or related experience. **Job Code RC1-CW3/31.**

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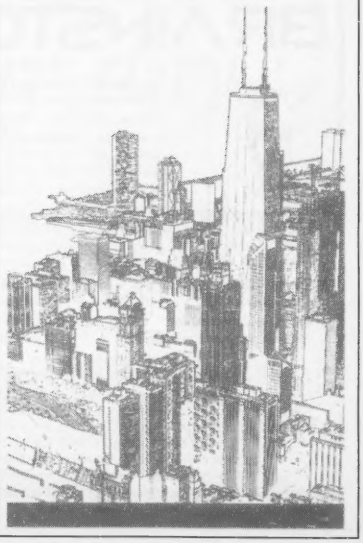

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Requirements:
- 5+ years' selling networking products and solutions to government and large corporate organizations within the New England area
- Account management and multi-vendor solution selling experience
- Track record of meeting/exceeding quota

SENIOR SYSTEMS ENGINEERS

Requirements:
- 4+ years' providing sales technical support
- MCSE, CNE/MCNE, CCIE or equivalent certifications
- Excellent communications skills

For the right individuals we offer professional growth through a variety of challenging assignments, association with other network professionals and additional training/certifications options. DSNC provides LAN/WAN design and installation, consulting, database development, imaging products and services, project management, network management and network products.

Qualified individuals please send or fax resume to: ***DSNC, Dept. CW, 34705 W. 12 Mile Rd, Suite 300, Farmington Hills, MI 48331, Fax: 810-489-1007.*** Equal Opportunity Employer

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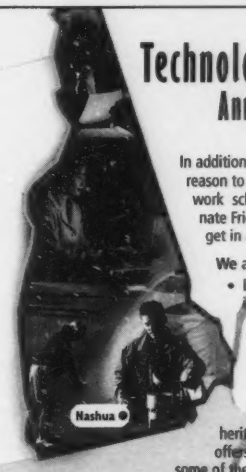

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Embedded Operating Systems

Develop real-time embedded software for the next generation of high-performance, heterogeneous, scaleable, parallel processors. Experience in one or more of the following: UNIX, Sun/UNIX, C, C++, JAVA, real-time programming, real-time Operating Systems (VxWorks, PSOS), X-Windows/Motif, Device Drivers, Diagnostics and Digital Signal Processing.

Firmware Engineer

Responsible for developing software and firmware in a microprocessor environment. Requires experience in assembly language programming, microprocessors and DSP. Familiarity with 80C550 microcontrollers, DSP 56000 or LONWORKS network controllers a plus.

Software Modeling

Develop advanced network technology (Myrinet, SCI, Fibre Channel, ATM, etc.). Experience with system-level performance modeling and discrete event simulation. Familiarity with C/C++, BONES, Foresight, OPNET, operating systems, parallel processing architectures and mapping of algorithms is desired.

Software Test Engineers

Multiple openings available. Software testing using Ada, C, C++, UNIX, Rational Apex, TYX run-time system a plus. LabView, LabWindows in these technical areas: graphics including graphic user interfaces, BIT, 1553B, RISC, and real-time systems. Travel required for some positions.

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- **Countermeasures**
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Perform software systems engineering in the areas of mission planning, mission rehearsal, training systems, and state of the art mapping and imagery display system. Support the analysis of customer specifications and the generation of system requirements. Perform trade-off analysis to support special systems studies and ECP activities. Assist in the support of new business activities; including development of test procedures and test execution. Minimum of 4 years' work experience encompassing a broad range of technical responsibilities.

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Software Engineers
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Applications Developers
Requires experience with client/server development with VB, PowerBuilder, Visual C++, Microsoft and Borland MFC, OWL as well as relational database experience with Oracle, Sybase or MS-Access. BS/MS in Computer Science or equivalent experience preferred.

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SENIOR SOFTWARE ENGINEER: (2 positions) 40 hrs/wk. 8 a.m. - 5 p.m., $59,500/yr. Carry out the design and development of computer software application systems and networking software utilizing IBM mainframe computers, UNIX workstations, C, ASSEMBLER, UNIX, IMS, and DB2. Reqr. bachelor's degree in Computer Science, or Electrical Engineering or Mechanical Engineering. Reqr. 5 yr. expr. in job offered or 5 yr. expr. in Systems Analysis &/or S/W Engineering &/or Programming &/or Computer Consulting. Reqr. work experience developing applications with IBM m/f and with UNIX, C, ASSEMBLER, IMS, and DB2. Employer is a s/w development/consulting firm. Relocation to client sites throughout the U.S. for periods of 6 mos. to 2 yrs. required. "Employer paid ad." E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref No: 154896

Systems Analyst-Design, develop & implement network systems on UNIX based hardware using C language. Use Korn script and SAD stream editor. Prepare program specs & sys docs. Req Bach in Comp. Sci., Elect. Engr. or Math & 2yrs exp. Employer is a consulting company, assignments vary from 6 mo to 2 yrs relocation required. M-F, 8AM-5PM, 40 hrs/wk, $47,000/yr Send resume and copy of ad to COMSYS TECHNICAL SERVICES/ISD, Attn: Michelle Olsen, Re: VGR 18350 Mt. Langley, Suite 101, Fountain Valley, CA 92708

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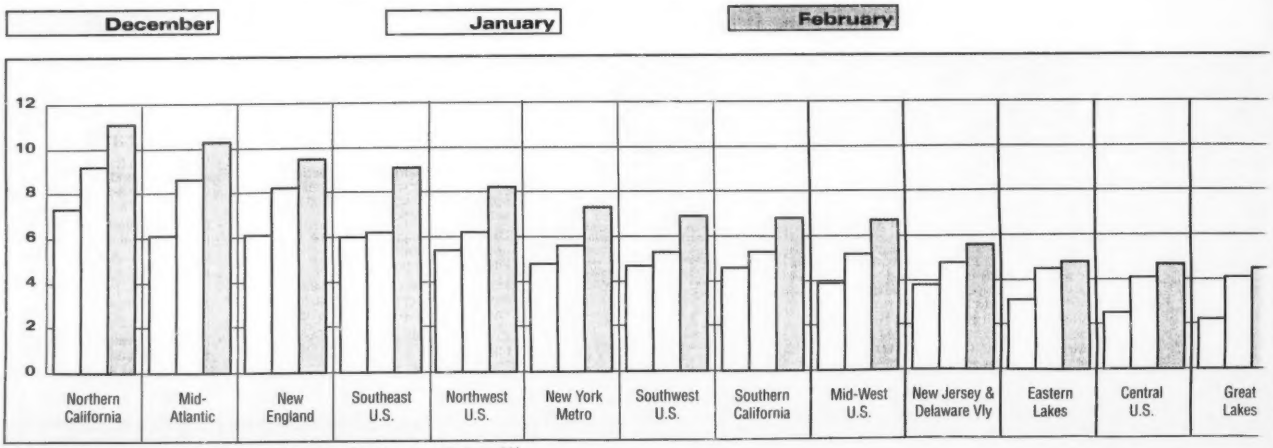
AA/EEO/Title IX

SOFTWARE ENGINEER:(2 positions) 40 hrs/wk. 8 a.m. - 5 p.m., $53,000/yr. Carry out the design and development of s/w application systems, prepare test scenarios, conduct testing and participate in implementation of system utilizing IBM Mainframe, MVS, CICS, COBOL, and IMS. Reqr. bachelor's degree in Computer Science, or Electrical Engineering or Mechanical Engineering or equivalent. Equivalent includes 6 yrs. experience in job offered or in related occupation in lieu of bachelor's degree and 2 yrs. experience in job offered or related occupation. Reqr. 2 yr. expr. in job offered or 2 yr. expr. in Systems Analysis &/or S/W Engineering &/or Programming &/or Computer Consulting. Reqr. work experience in developing application systems and with IBM mainframe, MVS, COBOL, and IMS. Employer is a s/w development/consulting firm. Relocation to client sites throughout the U.S. for periods of 6 mos. to 2 yrs. required. "Employer paid ad." E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. No: 155296

Software engineer with 2 years of experience as a s/w engineer or computer professional, who will develop s/w systems, applying computer science, engineering, and mathematical analysis, with 2 years of experience using ORACLE RDBMS, ORACLE Financials, ORACLE Forms, ORACLE Reports, PL/SQL, and SQL. Analyzes s/w reqs. and performs testing and user training after development. Extensive travel and frequent relocation. MA degree in comp. sci. field $72,000/yr., 40 hours/wk., 9:00 - 5:00. Send resumes, listing job order number 8021025, to: Ms. Charlene Cogley, Manager, 2103 Ninth Ave., Beaver Falls, PA 15010.

CorpTech Career Index: Information Technology

Percent change in number of employees by region



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Ref #D0323 - Carry out the development from initial systems study and design to system implementation and using DB2, CICS and COBOL. Will accept 3 years college education and 3 years exp. as a computer professional in lieu of the required Bachelor's degree and 2 years exp. in the job specified, provided that, 2 of the 3 years exp. as a computer professional are in the job duties specified. $52,500/yr

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Ref #F0323 - Systems analysis and design; development of program specifications & system documentation; development of on-line and batch programs and performing unit and system testing. $52,000/yr

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Software Engineer, 40 hrs/wk, 8am-5pm, $42,370/yr. Design & develop software for Open Architecture Control of real time Distributed Control Systems using object-oriented design, multi-tasking & client/server technology. Set up communication protocols. Work with industrial programmable controllers. Tools: Borland C++; MS-Visual C++; Assembler Windows; Windows NT; Windows Sockets; IPC; OWL; OGL; MFC; WIN 32; WIN 16. M.S. in Electrical Engineering as well as 1 yr exp. in job offered or as Design Engineer required. Graduate education or exp. must include: designing & developing programmable controllers in multi-tasking real time environment; designing for communication protocols; object-oriented design; C/C++; Assembly; Windows NT. Must have proof of legal authority to work permanently in the U.S. Send two copies of both resume and cover letter to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 3 South, Chicago, IL 60605, Attention: Brenda Kelly, Reference #V-IL-16232-K. NO CALLS. An Employer Paid Ad.

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Boxlights new compact 2020 is a true 800 x 600 SVGA projector, weighs just 11 pounds, and is compatible with a wide variety of audio and video sources. This multimedia projector is designed with the traveling presenter in mind.
At 4.9" x 9.4" x 13.5" the 2020 weighs 50% less than current multimedia projectors on the market, and fits into most attaché cases.
The Boxlight 2020 uses TFT active matrix LCD technology and is compatible with SVGA, VGA and Macintosh computers. A 400 watt EVD (2) lamp with 200 ANSI lumens provides exceptional brightness and clarity. Its color palette of 16.7 million colors ensures presentation colors remain vivid and true.
The Boxlight 2020 projector renders true 800 x 600 resolution, which dramatically improves color quality, clarity and depth, and is ideal for popular Windows 95 applications and current PC laptop compatibility. Comparatively, most high-resolution projectors employ a standard 640 x 480 area, resulting in a noticeably less-detailed image quality.
The Boxlight 2020 connects to a variety of audio and video sources, including NTSC, PAL, SECAM composite and S-Video.
Included with the 2020 are stereo audio inputs and outputs, allowing users to connect to any professional sound system for large-room presentations. The 2020's powerful built-in speakers and amplifier broadcast crisp, clear sound ideal for smaller, conference room settings. A high definition lens with variable focus projects images up to a 13.5 foot diagonal.
An 8-button programmable remote including presentation software, gives presenters familiar mouse-like control and provides basic multimedia presentation effects. A palm-size remote is also included for simple forward and reverse presentation control from up to 18 feet away.
Available directly from Boxlight Corporation, pricing starts at $5,999. Call 800-762-5757 or 360-779-7901.
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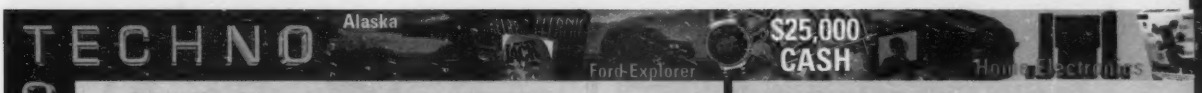
Cybex announces marketing partnership with Microage

Cybex Computer Products Corporation announced today that it has entered a marketing partnership with MicroAge Computer Centers of Tempe, Arizona to market Cybex products. MicroAge will market Cybex products to their franchisees and affiliates through it's Sourcing Services Division. As a part of the partnership, Cybex will participate in MicroAge's internal marketing programs.
MicroAge will initially market Cybex's AutoView Commander and Personal Commander II to its customer base of over 25,000 VARs that purchase networking products from MicroAge. Cybex will participate in MicroAge marketing programs to support the product roll-out, including attendance at MicroAge's Solutions '97 conference, advertising in MicroAge's Real Time magazine, reseller pricing promotional programs, and MicroAge sales training events. Cybex expects to add additional products to the program in the future.
"Our marketing partnership with MicroAge extends our distribution to a much broader base of VARs than our direct sales programs in the past," stated Stephen Thornton, President and CEO of Cybex. "We expect this partnership to improve our market share among this important group of dealers."
"MicroAge is constantly evaluating products to offer to our franchisees and affiliates," stated Gary Palenbaum, Supplier Development Manager for MicroAge. "Our goal is to provide our reseller partners with products that are of high quality and represent excellent value for their customers. Cybex's products meet and exceed our expectations in these areas."
"MicroAge's reputation for successfully selling and supporting network products to VARs was a key element in our decision to enter into this partnership," stated Gary Johnson, Vice President of Channel Development. "We believe our marketing programs with MicroAge will assist us in recruiting additional VARs to sell our products, further expanding our customer base."



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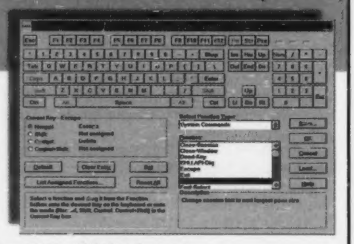

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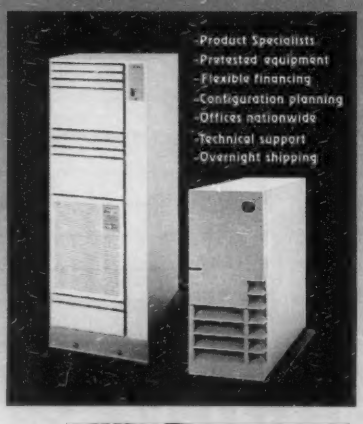

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For winners list (available after 8/30/98) send self-addressed, stamped envelope by 1/15/98 to: Super Prize Winners, P. O. Box 9192, Medford, NY 11763-9192.

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Editor Paul Gillin

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Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171 Framingham, MA 01701-9171
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Name Title Company Address City State Zip

The Week in Stocks

Gainers

PERCENT

Netcom On-Line	33.8
IPL Systems Inc.	21.4
Micrografx Inc.	18.8
Iomega Corp.	18.1
Cascade Communications	13.9
Centura Software	12.9
Wall Data Inc.	12.6
Open Market Inc.(L)	12.3

DOLLAR

Intel Corp.	9.88
IBM	6.00
Motorola Inc.	5.38
Western Digital Corp.	5.25
Xilinx(H)	5.00
America On-Line	3.75
Quantum Corp.	3.56
Cascade Communications	3.50

Losers

PERCENT

Dataware Technologies Inc.	-27.3
Banyan Systems Inc.(L)	-21.7
System Software Assoc (L)	-20.3
Radius Inc.	-20.0
Software Spectrum Inc.	-16.6
State of the Art (L)	-14.0
RecotekInc.(L)	-13.3
SynOpsys(L)	-13.0

DOLLAR

SynOpsys(L)	-4.00
Micrel Semiconductor Inc.	-3.25
Software Spectrum Inc.	-3.19
Paychex	-2.06
Micro Touch Systems Inc.	-2.00
Security Dynamics Tech.	-1.94
Bell Atlantic Corp.	-1.88
SBC Communications	-1.88

INDUSTRY ALMANAC

All eyes on new Novell CEO

Over the past year, the stock of Novell, Inc. (Nasdaq: NOVL) stock has performed like a slow-moving iceberg.

Helping drive down the stock's value was the fact that the company was without a CEO for more than six months, and Microsoft Corp.'s NT Server has continued to turn up the heat on Novell's market share in network operating systems.

The March 18 appointment of Eric Schmidt, chief technology officer at Sun Microsystems, Inc. in Mountain View, Calif., as Novell's chairman and CEO provided a modest boost. He will start work April 7.

Last spring, Novell's stock sold for $13 to $14 per share, but it has since declined to the $9 to $11 range. When the company announced Schmidt's appointment, the stock increased by more than $1 but remained less than $11.

Schmidt's hiring has won praise from analysts, who are cautious about Novell's future. "I think that bringing in Schmidt is a positive move, but I think there is a lot of work yet to be done," says Jean Orr, an analyst at A. G. Edwards in St. Louis.

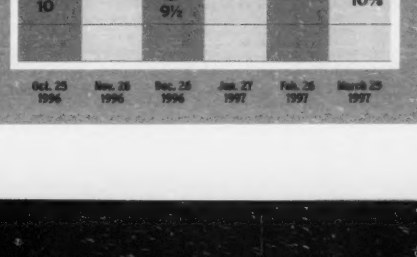
Novell's biggest asset, analysts agree, is its installed base. Approximately 4 million servers, supporting 65 million users, run Novell software, according to the Orem, Utah-based company. But Novell has posted no revenue growth and suffered net losses over the past several years, Orr says.

In a bid to reverse the company's slide, Schmidt is expected to move Novell more rapidly toward the Internet and intranets, narrow its focus to key products, push Java integration and provide clarity of direction.

Michael J. Geran, an analyst at the Pershing Division of Donaldson, Lufkin & Jenrette Securities Corp. in Jersey City, N.J., says Novell's stock is undervalued. "Until people have greater confidence that they are marching in the right direction . . . there is going to be skepticism," he says. — Patrick Thibodeau

FLOATING ALONG

In a booming technology stock market, Novell shares have languished



Exch	52 Week High	52 Week Low	Range	March 27 Close	Wk Net Change	Wk Pct Change
COMS	81.38	30.63	3 COM Corp.	35.00	1.88	5.7
AIT	65.00	49.63	AMERITECH Corp.	61.75	-0.13	-0.2
ASND	80.25	38.50	Ascend Communications	53.69	2.06	4.0
T	44.25	31.63	AT & T	35.38	1.00	2.9
BNYN	10.75	2.19	Banyan Systems Inc. (L)	2.25	-0.63	-21.7
BAY	36.88	15.38	Bay Networks Inc. (L)	17.38	0.88	5.3
BEL	71.38	43.50	Bell Atlantic Corp.	61.13	-1.88	-3.0
BLS	47.63	35.25	Bellsouth Corp.	43.25	-0.88	-2.0
BRKT	42.25	14.00	Brooktrout Technology	14.75	-1.00	-6.3
CS	43.63	28.50	Cabletron Systems	31.50	1.88	6.3
CSCC	91.25	23.50	Cascade Communications	28.63	3.50	13.9
CGRM	24.13	9.38	Centigram Communications (L)	10.25	0.38	3.8
CSCO	75.75	40.50	Cisco Systems Inc.	52.25	0.63	1.2
CLIX	8.25	2.06	Compression Labs Inc. (L)	2.13	-0.13	-5.6
CMNT	10.50	4.75	Computer Network Tech.	5.50	-0.06	-1.1
XCOM	12.75	4.75	CrossComm	8.13	0.00	0.0
DIGI	35.88	12.63	DSC Communications	22.50	0.63	2.9
FORE	44.75	17.00	FORE Systems Inc. (L)	17.94	-0.56	-3.0
GDC	18.88	6.63	General Datacomm Inds. (L)	6.88	-0.38	-5.2
GSX	46.75	35.25	General Signal Networks	39.75	-0.25	-0.6
GTE	49.38	37.75	GTE Corp.	46.50	-0.13	-0.3
LU	60.63	29.75	Lucent Tech.	53.25	0.38	0.7
MADGF	41.63	8.13	Madge Networks NV	8.75	-0.63	-6.7
MCIC	38.75	22.38	MCI Communications Corp.	37.88	-0.25	-0.7
MNPI	32.00	5.50	Microcom Inc.	9.75	-0.13	-1.3
NETM	18.88	2.69	NetManage Inc. (L)	2.94	-0.31	-9.6
NTRX	10.88	2.50	Netrix Corp. (L)	2.75	0.00	0.0
NCDI	16.25	2.88	Network Computing Devices	11.00	0.88	8.6
NWK	32.50	11.13	Network Equipment Tech.	14.00	-0.25	-1.8
NETG	30.25	15.25	Network General	21.88	0.50	2.3
NN	37.25	20.25	Newbridge Networks Corp.	30.00	1.00	3.4
NT	77.00	45.00	Northern Telecom Ltd.	68.00	0.88	1.3
NOVL	15.63	8.38	Novell Inc.	10.25	-0.06	-0.6
NYN	53.38	42.00	Nynex Corp.	46.00	-1.50	-3.2
OCTL	31.75	13.50	Octel Communications Corp.	16.88	-0.88	-4.9
ODSI	27.50	10.75	Optical Data Systems Inc. (L)	11.75	-1.25	-9.6
PAC	41.75	27.50	Pacific Telesis	38.63	-1.13	-2.8
PCTL	41.25	13.00	Picturetel Corp. (L)	13.00	-1.50	-10.3
PTON	6.50	1.31	Proteon Inc. (L)	1.69	-0.19	-10.0
RACO	7.00	3.25	Racotek Inc. (L)	3.25	-0.50	-13.3
RETX	10.88	3.38	Retix	4.38	-0.06	-1.4
SBC	58.25	46.00	SBC Communications	53.00	-1.88	-3.4
SFA	20.38	12.00	Scientific Atlanta Inc.	17.00	0.00	0.0
SHVA	87.25	11.88	Shiva Corp. (L)	12.00	-0.56	-4.5
FON	48.00	34.50	Sprint Corp. (H)	46.63	-0.75	-1.6
SMSC	18.75	8.25	Standard Microsystems Corp.	10.25	0.13	1.2
USW	37.25	27.25	U S West Inc.	34.75	0.25	0.7
USRX	105.50	45.88	US Robotics	59.25	3.00	5.3
XIRC	31.13	11.13	Xircom	16.25	0.50	3.2
XYLN	76.00	17.13	Xylan Corp.	18.50	-0.25	-1.3
AALR	15.25	6.13	Advanced Logic Research	9.38	0.13	1.4
AAPL	28.88	15.13	Apple Computer Inc.	17.50	1.00	6.1
ASTA	8.50	3.94	AST Research Inc.	4.75	0.25	5.6
CPQ	87.88	35.88	Compaq Computer Corp.	78.00	3.13	4.2
DELL	76.00	15.25	Dell Computer Corp.	70.38	3.25	4.8
GATE	66.63	24.88	Gateway 2000 Inc.	53.38	1.94	3.8
HWP	60.00	37.75	Hewlett Packard Co.	56.00	-1.25	-2.2
MUEI	25.00	8.75	Micron International Inc.	20.75	0.75	3.8
NIPNY	65.00	49.88	NEC America	56.63	0.63	1.1
SGI	30.13	17.88	Silicon Graphics	20.63	0.38	1.9
SUNW	35.13	20.38	Sun Microsystems Inc.	30.13	2.00	7.1
AMH	14.00	8.13	Amdahl Corp.	9.75	0.00	0.0
DGN	20.75	9.00	Data General Corp.	18.13	-0.25	-1.4
DEC	63.25	27.00	Digital Equipment Corp.	28.75	0.50	1.8
IBM	170.13	89.13	IBM	139.63	6.00	4.5
MDCD	20.25	3.88	Meridian Data Inc.	4.00	-0.13	-3.0
NETF	6.13	1.25	NetFrame (L)	1.81	0.06	3.6
SQNT	20.13	10.50	Sequent Computer Sys.	15.13	0.25	1.7
SEQS	4.38	1.88	Sequoia Systems Inc.	2.38	0.06	2.7
SRA	35.13	16.63	Stratus Computer Inc.	31.75	1.75	5.8
TDM	15.25	8.38	Tandem Computers Inc.	11.88	-0.13	-1.0
UIS	9.13	5.38	Unisys Corp.	6.50	0.13	2.0
ADBE	45.13	28.50	Adobe Systems Inc.	42.13	1.88	4.7
AMSWA	7.81	3.63	American Software Inc.	7.19	-0.19	-2.5
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ARSW	82.75	21.00	Arbor Software	26.75	-1.25	-4.5
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BGSS	32.50	14.88	BGS Systems Inc.	29.25	-0.38	-1.3
BMCS	51.00	25.00	BMC Software Inc.	48.50	3.50	7.8
BOOL	27.50	14.00	Boole and Babbage	23.13	-0.38	-1.6
BORL	20.25	4.75	Borland Int'l. Inc.	7.13	-0.38	-5.0
BOBJY	55.50	8.63	Business Objects	10.75	0.63	6.2
CAYN	10.00	3.81	Cayenne Software Inc.	4.25	-0.13	-2.9
CNTR	6.75	2.63	Centura Software	4.38	0.50	12.9
COGNF	39.50	18.25	Cognos Inc.	27.25	2.63	10.7
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CSRE	32.00	10.75	Comshare Inc.	13.38	-0.75	-5.3
COSFF	13.88	8.13	Corel Corp.	8.63	0.00	0.0
DWTI	8.25	2.63	Dataware Technologies Inc.	3.00	-1.13	-27.3
FILE	60.00	15.38	Filenet Corp. (L)	16.63	0.25	1.5
FRTE	81.75	21.00	Forte Software	24.63	1.63	7.1
FTPS	14.38	4.88	FTP Software Inc.	5.94	-0.31	-5.0
HUMCF	47.63	23.00	Hummingbird Comm. Ltd.	28.00	0.94	3.5
HYSW	26.38	9.75	Hyperion Software Corp.	17.25	-0.38	-2.1
IRIC	16.38	11.00	Information Resources	13.94	-0.19	-1.3
IFMX	31.13	15.00	Informix Corp. (L)	15.50	-1.25	-7.5
INGR	17.50	7.38	Intergraph Corp. (L)	8.00	0.00	0.0
LEAF	9.38	1.31	Interleaf Inc.	1.63	-0.06	-3.7
ISLI	16.38	7.50	Intersoly Inc.	8.88	0.13	1.4
INTU	55.75	20.88	Intuit Inc.	24.38	0.19	0.8
TLC	30.31	7.00	Learning Co. (The) (L)	7.13	-0.63	-8.1
LGWX	22.25	5.25	Logic Works	5.94	-0.19	-3.1
MAPS	18.00	7.50	MapInfo Corp.	8.75	-0.25	-2.8
MATH	9.25	2.75	MathSoft	3.63	-0.38	-9.4
MCAF	65.50	23.50	McAfee Associates	45.75	3.31	7.8
MENT	18.50	7.38	Mentor Graphics	8.50	-0.63	-6.8
MHFGY	21.25	9.63	Micro Focus	20.50	0.75	3.8
MGXI	18.63	4.00	Microgrape Inc.	5.94	0.94	18.8
MSFT	103.50	49.18	Microsoft Corp.	96.00	0.81	0.9
ORCL	51.00	26.50	Oracle Corp.	40.13	0.13	0.3
PMTC	64.25	33.75	Parametric Technology	47.88	-1.88	-3.8
PARQ	14.63	1.19	ParcPlace Systems Inc.	1.50	0.00	0.0
PSFT	56.75	23.88	Peoplesoft	42.75	3.25	8.2
PTEC	20.38	12.50	Phoenix Technologies	15.63	0.00	0.0
PSQL	13.75	5.50	Platinum Software	10.50	0.13	1.2
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PRGS	23.00	12.13	Progress Software Corp.	16.75	0.25	1.5
RNBO	24.00	14.63	Rainbow Technologies Inc.	17.13	0.38	2.2
REDB	61.00	12.56	Red Brick Systems Inc.	16.00	-0.25	-1.5
SAPE	58.25	29.25	Sapient Corp.	39.50	1.38	4.0
SCOC	9.13	5.50	SCO Inc.	6.25	-0.25	-3.8
SDTI	54.50	21.00	Security Dynamics Tech.	27.50	-1.94	-6.6
SOTA	19.75	10.00	State of the Art (L)	10.00	-1.63	-14.0
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SDRC	37.38	15.00	Struct. Dynamics Research	21.75	-0.13	-0.6
SYBS	27.75	13.25	Sybase Inc. (L)	13.75	-0.25	-1.8
SYMC	18.38	8.75	Symantec Corp.	14.38	0.38	2.7
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SSAX	25.50	6.38	System Software Assoc. (L)	7.23	-1.88	-20.5
SYSF	36.50	7.25	Systemsoft Corp.	9.75	0.00	0.0
TRUV	9.63	2.25	Truevision Corp.	2.63	0.00	0.0
VIEW	17.50	8.38	Viewlogic Systems	15.50	-0.13	-0.8
VMRK	12.63	5.50	VMark Software Inc.	6.88	-0.25	-3.5
WALK	15.63	9.38	Walker Interactive Systems	12.63	0.13	1.0
WALL	27.50	12.25	Wall Data Inc.	17.88	2.00	12.6
WANG	26.13	15.38	Wang Laboratories Inc.	17.88	-1.13	-5.9
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CSRV	35.50	8.63	Compuserve Corp.	9.25	-0.75	-7.5
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LCOS	29.25	5.75	Lycos Inc.	15.88	1.63	11.4
NETC	44.50	7.88	Netcom On-Line	11.38	2.88	33.8
NSCP	75.25	25.50	Netscape Comm. Corp.	31.44	-0.06	-0.2
OMKT	42.25	8.63	Open Market Inc. (L)	10.25	1.13	12.3
PSIX	19.38	6.75	PSINet	7.63	0.38	5.2
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RAPT	38.50	12.63	Raptor Systems (L)	12.88	-0.63	-4.6
SCUR	38.25	5.00	Secure Computing Corp. (L)	5.50	-0.50	-8.3
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YHOO	43.00	15.50	Yahoo! Inc.	29.13	1.25	4.5
AMD	48.50	10.25	Advanced Micro Devices	41.75	2.13	5.4
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CYRX	36.50	11.50	Cyrix	19.75	0.44	2.3
INTC	165.00	54.13	Intel Corp.	141.75	9.88	7.5
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LSI	39.63	17.00	LSI Logic Corp.	35.13	1.38	4.1
MCRL	41.50	12.00	Micrel Semiconductor Inc.	33.25	-3.25	-8.9
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TXN	87.25	40.50	Texas Instruments	79.25	1.38	1.8
VLSI	29.25	10.38	VLSI Technology	18.13	0.81	4.7
XLNX	51.00	24.50	Xilinx (H)	49.88	5.00	11.1
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ADPT	46.88	17.50	Adaptec Inc.	37.63	1.63	4.5
APCC	31.50	8.50	American Power Conversion	23.25	-0.13	-0.5
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CREAF	15.13	3.50	Creative Technology Ltd.	9.00	-0.75	-7.7
RACE	24.50	3.75	Data Race Inc.	14.38	0.88	5.7
OTM	12.50	4.25	Dataram Corp.	9.50	0.06	0.7
EMC	39.88	16.50	EMC Corp.	35.50	2.00	6.0
EMLX	21.38	12.38	Emulex Corp.	15.00	0.00	0.0
ESCC	29.00	19.50	Evans and Sutherland	25.94	-0.06	-0.2
EXBT	22.75	9.50	Exabyte	12.50	-0.25	-2.0
IISLF	4.13	1.38	Intelligent Info. Systems	1.56	-0.19	-10.7
IOM	55.13	10.88	Iomega Corp.	17.13	2.63	18.1
IPLS	8.25	1.25	IPL Systems Inc.	2.13	0.38	21.4
KMAG	37.00	17.63	Komag Inc.	29.75	0.75	2.6
MTSI	29.75	12.88	Micro Touch Systems Inc.	20.75	-2.00	-8.8
PEAK	27.50	8.88	Peak Technology Group (L)	8.88	-0.06	-0.7
PNCL	12.00	2.00	Pinnacle Micro Inc.	2.63	-0.31	-10.6
AQM	6.75	3.75	QMS Inc.	4.38	-0.25	-5.4
QNTM	46.00	10.88	Quantum Corp.	41.19	3.56	9.5
RDUS	4.88	0.25	Radius Inc.	0.25	-0.06	-20.0
SEG	56.25	18.13	Seagate Technology	46.50	3.25	7.5
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STLC	8.75	0.53	Streamlogic Corp.	0.72	0.03	4.5
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EDS	63.38	40.63	Electronic Data Systems Corp. (L)	42.88	1.00	2.4
INAC	40.63	15.38	Inacom Corp.	23.38	0.25	1.1
INEL	11.50	2.81	Intelligent Electronics	3.31	-0.19	-5.4
KEA	37.88	14.25	Keane Inc.	33.00	2.50	8.2
MICA	25.00	9.63	Microage Inc.	13.44	-0.25	-1.8
PAYX	63.63	37.63	Paychex	41.50	-2.06	-4.7
PMS	55.50	33.13	Policy Management Sys.	43.38	0.25	0.6
REY	30.63	20.00	Reynolds and Reynolds	26.38	-1.00	-3.7
SCBI	30.50	14.44	SCB Computer Tech. Inc.	17.00	0.13	0.7
SEIC	26.38	17.75	SEI Corp.	20.75	-0.63	-2.9
SMED	72.13	42.25	Shared Medical Systems	50.19	1.63	3.3
SSPE	33.50	16.00	Software Spectrum Inc.	16.00	-3.19	-16.6
SNDT	30.75	31.25	Sungard Data Systems	44.75	0.00	0.0
VST	29.75	6.88	VanStar Corp. (L)	8.13	0.25	3.2

KEY: (H) – New annual high reached in period (L) – New annual low reached in period

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How to contact Computerworld

TELEPHONE/FAX

Main phone number ..... (508) 879-0700
All editors unless otherwise noted below
Main fax number ..... (508) 875-8931
24-hour news tip line ..... (508) 820-8555

E-MAIL

Our Web address is www.computerworld.com. All staff members can be reached via E-mail on the Internet using the form:
firstname_lastname@cw.com.
All IDG News Service correspondents can be reached using the form:
firstname_lastname@idg.com.

LETTERS TO THE EDITOR

Letters to the editor are welcome and should be sent to:
letters@cw.com.
Please include your address and telephone number.

MAIL ADDRESS

PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701

SUBSCRIPTION/BACK ISSUES

Phone ..... (800) 669-1002
E-mail ..... circulation@cw.com.
Back Issues ..... (508) 820-8129

REPRINTS

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CONTACTING CW EDITORS

We invite our readers to call or write with comments and ideas. It is best to submit ideas to one of the department editors as well as to the appropriate beat reporter.

Editor Paul Gillin (508) 620-7724
Executive Editor Maryfran Johnson (508) 820-8179

Department Editors/News

News Editor Patricia Keefe (508) 820-8183
Sections Editor Kevin Fogarty (508) 820-8246
Assistant News Editor Neal Weinberg (508) 820-8177
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Staff Writers/News

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Windows 97 delay may push users to Win NT

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users have been slow to move to Windows 95 — more than 80% of large corporate desktops are still running Windows 3.1, according to San Jose, Calif.-based Dataquest. And the latest delay, which has observers renaming the upgrade Windows 98, could persuade those on the fence to leapfrog to NT.

OPERATING SYSTEMS

A *Computerworld* survey of 100 information systems professionals found that 87% said a late shipping date for Windows 97 won't affect their purchasing plans. But 19% of the 63 respondents whose migrations are under way had some concern about the delay, and 46% said they are now more likely to upgrade to Windows NT (see chart, page 1). Some users expressed concern about the quality of Windows 97/98 when it does ship and suggested the delay is indicative of potential problems.

IT MAKES YOU WONDER

"Whenever a software product is supposed to be out and it isn't, you start wondering why," said Mark Pollard, manager of IS at Irving, Texas-based Cable & Connector Warehouse, Inc., which currently runs Windows 95. "It [could be] just like with Windows 95. When it did come out, it had a lot of bugs."

Kent Polzin, manager of technical operations at Simmons Co. in Atlanta, said he wonders whether he should migrate his users from Windows 3.1 to Windows 95 or NT.

But Don Resh, chief information officer at Retired Persons Services, Inc., a pharmacy services company owned by the American Association of Retired Persons that fills more than 40,000 prescriptions per day, said he has no doubts. He has fewer than 500 users on Windows 95 — with the remaining 2,000 on some version of Windows NT. The Windows 95 users will skip over Windows 97 and move to NT, he said, because it is a better enterprise operating system.

Robert McRobbie, a LAN administrator at Honeywell, Inc. in Fort Washington, Pa., said his company is happy with Windows 95 but will skip over Windows 97 in favor of NT — eventually.

"We're not anxious to upgrade [to NT]. We want to follow the technology, so we'll stay behind the wave. Being on top of the wave can be a neat ride, but you can also take a beating," McRobbie said. A decision to move to NT would also require the company to invest in new hardware and substantial upgrades, he said.

NO NT PLANS

Adam Jilling, an electronics engineer at the U.S. Naval Undersea Warfare Center in Newport, R.I., said he is less concerned about the delay. He said he doesn't plan to move to NT. "At this point, NT doesn't have the reputation to run the applications we are running," he said.

Jilling isn't alone, according to Michael Gartenberg, an analyst at Gartner Group, Inc. in Stamford, Conn. Gartenberg said he doubts hordes of users will scramble for NT over Windows 95. He said there are three obstacles to such a migration: costly hardware upgrades, legacy 16-bit applications and lack of support for mobile users.

Also likely to hold up the potential migration is integration with Internet Explorer 4.0 — which has had its share of bugs and is tightly woven into Windows 97/98, Gartenberg said.

Phil Holden, a product manager at Microsoft, said several factors are holding up the release of the Windows 97/98 beta — which the company still expects to have out in the first half of this year. Those factors include support for new standards, such as Digital Versatile Disk technology, which allows for common storage of music, video and data; integration with Internet Explorer Version 4.0; and support for other new standards such as power management.

The delay will also likely leave Santa Claus without any machines preloaded with Windows 97, but Holden said Microsoft relies on hardware makers for feedback on the product — which hasn't been extensive enough to release a beta yet.

Larry Garden, manager of technical services at Brewers Retail, Inc. in Mississauga, Ontario, said he has already made the decision to move users from Windows 3.1 to Windows NT 4.0 — mainly for its superior security. But those who have been waiting for the release of Windows 97 for its Zero Administration Tools may be frustrated by the delay, he said.

"I think Windows 97 is going to have some nice features that the IT community has been waiting for, like Zero Administration and common interface with NT 5.0," he said. □

Win 97 delay snags NetPC users

Another likely short-term repercussion of the Windows 97 delay is that, as the software management underpinning of Microsoft's NetPC, the late arrival of Windows 97 could leave early adopters less than thrilled.

Because the centralized management tools, called the Zero Administration for Windows initiative, are supposed to be contained within Windows 97/98, NetPC users may have to settle for the benefits of standardized hardware.

Michael Gartenberg, an analyst at Gartner Group, said NetPC users should either install Windows 95 and take advantage of what it has in terms of better hardware manageability or deploy Windows NT. Microsoft has said it will provide a management tool kit for NT in the next three months.

Although Microsoft has resisted the idea of extending Zero Administration to Windows 95 desktops, Gartenberg said he wouldn't be surprised to see those tools offered as a result of customer demand.

"It is fair to say we're looking at a number of things to help them with the Windows platform," said Phil Holden, a product manager at Microsoft. — April Jacobs

Millennium budget woes

CONTINUED FROM PAGE 1

don't want to shortcut maintenance and development," said Shawn Bohner, an analyst at Meta Group in Reston, Va.

Many organizations are paying for their millennium conversion projects by draining their IS maintenance budgets. That could be a huge mistake, analysts warned, because such a robbing-Peter-to-pay-Paul approach could potentially cripple end-user support.

RESOURCE DRAIN

Even worse, many year 2000 projects are sapping funds and resources from critical development projects intended to deliver a competitive advantage.

Year 2000 "will have a much bigger hit on existing projects than people think," said Bruce Hall, an analyst at Gartner Group, Inc. in Stamford, Conn.

That is a concern at the Wichita, Kan., division of The Boeing Co. The company has focused on developing new systems for the past two years for a project intended to help its commercial airplane group improve how it designs, finances and produces jets, said Fred Smith, year 2000 manager at the aerospace giant.

Boeing-Wichita is forcing each of its 15 business units to pay for millennium conversion work out of their own budgets with no additional funding. Smith said company executives are worried that too many of their business units will wait until the last minute to do year 2000 work — thus overwhelming some 600 IS staffers — or postpone their other application development projects.

URGENT AUDIT

To strike a chord between year 2000 and existing projects, Boeing plans to conduct an enterprisewide systems audit next quarter. Smith and other Boeing executives said they hope the audit will create a sense of urgency, prompting unit heads to begin scheduling their year 2000 conversions sooner. "There may not be enough tests available if every [unit] waits until the last quarter [of next year]," Smith said.

Some companies that face strong competitive and regulatory pressures have set up separate year 2000 budgets so product development and day-to-day maintenance won't suffer.

One such firm is BellSouth Corp. in Atlanta. Because of deregulation in the telecommunications industry, the telecommunications company is being forced by federal authorities to "open" the interfaces of its local-market switches to other carriers, said David Grant, manager of software engineering support at BellSouth.

> "We don't want to lose any [of BayBank's 1 million retail] customers" because of a protracted merger.
> — Steven McManus, BankBoston

To remain competitive in a deregulated market, BellSouth has set aside an undisclosed amount of additional funds for external programmers to do year 2000 work, while its own IS staff focuses on developing improved customer information systems geared "to keep customers happy and remain with BellSouth," Grant said.

BankBoston is approaching year 2000 as a line-item adjustment to its annual IS budget.

The former Bank of Boston, which announced its merger with BayBanks, Inc. in December 1995, doesn't want year 2000 to interfere with the two banks' systems consolidation. That is scheduled to be completed in May, said Steven McManus, communications manager of the bank's millennium project team.

"We don't want to lose any [of BayBanks' 1 million retail] customers" because of a protracted merger, McManus said. □

& A survey of 23 IS shops finds many feel year 2000 work is on schedule. Page 85

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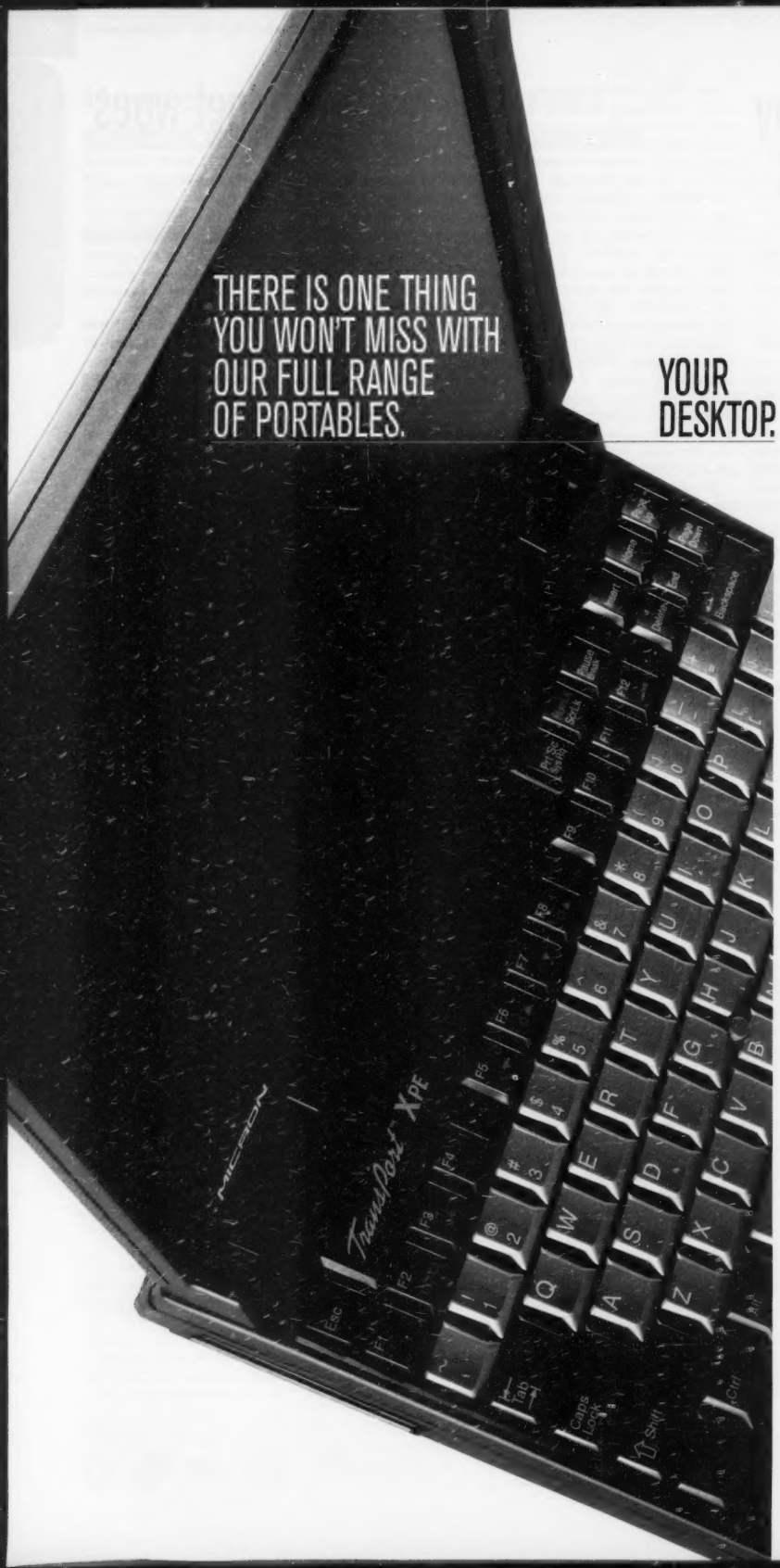

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COMMENTARY

Can Eric Schmidt save Novell?

David Coursey

My friend Eric Schmidt wasn't the obvious choice to become the next chairman and CEO of Novell. Schmidt, who remains chief technology officer at Sun until April 7, may not even have been Novell's first choice. But I do think he was an inspired choice.

In the interest of full disclosure, I'll confess I had high hopes for another friend, Robert Frankenberg, when he took over at Novell. And after they chased him away, I recommended that Novell hire a take-no-prisoners guy such as Jim Manzi, the former Maximum Leader at Lotus, to shake things up. My track record on these matters isn't what it might be.

I was surprised when Schmidt got the nod. But a quick benefit analysis makes me hope that Novell might finally turn things around — or get turned on its head, if that's what it takes.

As boss at Novell, Schmidt may suffer from many of the same problems Frankenberg did; he's a nice guy going into a company that didn't grow up nice. Ray Noorda, the former Novell president and CEO who left the company in 1994, may have been out of touch, but he was a tough manager and businessman.

Schmidt isn't seen as a manager or a business type. Wall Street is concerned; it considers Schmidt a propeller-head. To fight this perception, Schmidt must hire a top-notch business team (I'd steal trusted people from Sun if I were him) to show he's got the business side under control. He must move quickly, too. It's critical that Novell snag a great chief operating officer.

Schmidt is world-class on the technical side. Imagine somebody who has Bill Gates' level of technical savvy and is also a genuinely nice person and listens more than he talks. That's Schmidt. He's already promised that he's "changing jobs, not religions," which means Novell will move more decisively into the Java camp and will grow more Internet-focused. It isn't clear what Schmidt will do about NetWare, IntranetWare and the rest of Novell's operating systems mess.

To the extent that Novell must reinvent itself to survive — and I think it's to a large extent — Schmidt is the right man for the job. He can look at problems objectively and listen to the counsel of others. He also can attract bright people — a big plus for a company as brain-drained as Novell.

If you're a Novell customer, give Schmidt the benefit of the doubt — and a couple of months to figure out what needs to be done. Superimpose the better parts of Sun on the better parts of Novell, and you have a very interesting company. If you're a fan of what used to be called "open systems," Schmidt's your guy. He'll push Java and Internet all the way.

Schmidt is in a no-lose situation. If Novell continues its slide, then it was someone else's fault, and he couldn't save it. If he gets Novell moving in the right direction — toward Java, the Internet and some unknown new line of business — then he'll be a hero. □

Coursey is editor of "Coursey.com," an electronic newsletter at www.coursey.com. He will host Internet Showcase (www.internetshowcase.com) April 27-30 in San Diego. He'd love to hear your thoughts on Novell. Write him at david@coursey.com.

IS should back compatible technologies

Charles Babcock

The sense of head-spinning change that you get as an IS manager is an offshoot of a fairly simple phenomenon: the restoration of competition in the computer industry. Two centers of vitality are vying for leadership in advancing the state of the art.

One is the Microsoft/Intel camp and its large following of third-party developers. During the past 10 years, this group has toppled many cherished precepts and emerged as the dominant source of innovation.

The other is the Unix community (more precisely, the Unix/Java community), led by Sun, Oracle and Netscape. This camp is closer to the Internet. In the past year, it generated its own army of third-party followers, partly because of a generous infusion of venture capital. The Unix/Java camp now is challenging the PC leaders with its own rapid innovation.

My confidence of renewed competition isn't because the Unix/Java camp has united behind Unix or because it threatens to displace Microsoft at the desktop. Neither statement is true. But it is true that Unix advocates have assimilated the lessons of the PC revolution and are putting them to use.

For example, the Unix/Java crew has finally learned that appropriate technology available today is more important than the best technology promised for the future. Software is never finished. Chips never run as fast as they might. Getting things out the door when they're needed is where the action is.

For years, the Unix camp was proud that it had better technology than Microsoft, and it priced its products accordingly. But the PC revolution has taught that technology has to be appropriate to the present needs of customers and priced competitively. Sun learned that lesson and reduced Solaris prices to Windows NT levels.

Rather than try to wring early profits from Java, Sun sought market share, a strategy Microsoft inflicted on its Windows competitors long ago. That may explain the churlish tone Microsoft officials take when they explain their "me-too" stance on Java — it's never fun to watch your own tactics work against you.

Another measure of Microsoft's predicament is the migration of development talent toward Java. Microsoft used to command so much mind share that developers marched in lockstep to the Redmond beat. No more.

In addition to developer talent, Sun has gained the high ground on standards. It can say to Microsoft: "Don't tell me about standards. I'm too busy creating new ones for you to follow." When Microsoft talks about pushing into the enterprise with distributed systems, it confronts a well-developed CORBA standard with a new protocol, Internet InterOrb Protocol, for moving distributed objects across the Internet. Microsoft has to play catch-up again, this time by getting HP to propose the interface between CORBA and Microsoft's Component Object Model.

On a series of fronts (from messaging to directory services to network application development), Microsoft is struggling to match the best of a new generation of products. If it were confronting a single competitor, it might still be showing its old form. But it's confronting a coalition of powers — Sun, IBM, Netscape, Novell, Borland, Lotus and so on — each determined to adapt lessons learned during the PC revolution.

Resurgent competition seems to have resulted in proliferating technologies, but in fact they are clustering about the Wintel and Unix/Java camps. There is more noise, but there is also more background integration work being done inside each camp. Savvy information systems managers should pick and choose; they should use what's best for them and avoid potential lock-ins if zealots in either camp take off in their own proprietary direction.

The choice isn't always clear, but IS managers will have a valuable, long-term impact if they reward vendors that produce compatible technologies and shun vendors' more isolating, competitive initiatives. □

Babcock is Computerworld's technical editor. His Internet address is charles_babcock@cw.com.

The Back Page

alt.cw

Dispatches & images from the fringes of the electronic frontier

ONE GIANT LEAP FOR INTERNET COLLABORATION

The launch of the next space shuttle also will launch into orbit "Debian GNU/Linux," a radical, Unix-compatible operating system that will run an onboard hydroponics experiment. The operating system was written by 200 volunteer computer programmers who collaborated over the Internet and never met each other in "meatspace." The volunteers are giving away the source code for free at www.debian.org. Debian uses a Linux kernel and has hundreds of software packages.

Digital snafus

The Colombian government recently said it would negotiate via electronic mail with Marxist guerrillas to obtain the release of 60 hostages. But just after the announcement, the government received a puzzled message from the guerrillas saying they had already received two E-mail messages that claimed to be from the government. The messages are believed to have come from right-wing saboteurs who don't want any negotiations to take place, the British Broadcasting Corp. reported.

A Swedish hacker dialed in to 11 of Florida's 911 emergency systems, tying up lines and harassing operators, the Associated Press reported. He was convicted of a misdemeanor in Sweden. The crime would have been a felony in the U.S.

The National Institute of Standards and Technology (NIST) asked vendors to throw away a virus-infected disk listing attendees at a NIST conference — which was about information systems security, reported *Infosecurity News* in Framingham, Mass.

■ Send your alt.cw contributions to **mbetts@cw.com.** If your item is used, you'll receive a cool T-shirt.

The future according to Dilbert

The next book by Dilbert creator Scott Adams – The Dilbert Future (Harper Business), to be released June 4 – makes the following predictions about the 21st century:

- There will be a huge market for technology products that help workers goof off and still get paid.
- Network computers will be purchased and used with the same enthusiasm as home exercise equipment.

Computerworld INDEX

424,000 Web pages that haven't been updated since **early 1995**

$61,119 Annual pay for a **public school teacher** in New York

$120,000 Annual pay for a **year 2000 Cobol programmer** in New York

No. 1 time-consuming activity on home PCs: "Futzing" with files, wallpaper and screen savers

31% Percentage of companies reporting **employee abuse** of Internet privileges

$1 billion Estimated annual revenue of Internet **pornography sites**

Source: Wall Street Journal, New York; Meta Group, Inc., Stamford, Conn.; NPD Group, Inc., Port Washington, N.Y.; Computer Security Institute, San Francisco; Interactive Week, Garden City, N.Y.

If the help desk can't help, try the Computer Voodoo doll from Archie McPhee and Co. in Seattle. Black pins create crashes; white pins stop them.

Inside Lines

Takin' it to the streets ...

The battle between database behemoths Informix and Oracle has turned into a brawl of biting billboard barbs. First, Informix ridiculed Oracle as a "dinosaur" on a billboard located at the highway exit that leads to Oracle headquarters. Now Ellison & Co. have fired back with a road sign of their own, sneering at Informix's recent lawsuit against Oracle over programmers who jumped from the Informix ship. The billboard says: "Informix: Hiring lawyers experienced in suing programmers. Oracle: Hiring experienced programmers."

Imitation is a form of flattery (0.8 probability)

Perhaps hoping some of that ol' Gartner Group magic will rub off on them, database vendors have taken to copying the consulting giant's famous magic-quadrant boxes in their product-pitch slides. Sybase pilfered the quadrant concept for briefings on its World Wide Web-based Jaguar transaction server last week. Oracle did the same thing earlier this month when a new version of its text server was announced. Not surprisingly, each company put its own technology in the coveted upper-right-hand box.

When bad things happen to good systems

It looks as though it isn't just Digital's OpenVMS users who have to do some quick patchwork to prevent bad things from happening to their systems. Digital has been sending out advisory notes over the last two weeks — this time aimed at its Unix user base — warning of a potential security vulnerability in some versions of the operating system. Under certain circumstances, the glitch apparently lets unauthorized users access sensitive areas of the system. Digital is making software patches available. For more information, go to ftp://info.cert.org/pub/cert_bulletins/VB-97.01.dec.

Secure your password as I say, not as I do

Like many professional gatherings these days, Open Systems Security '97 in Orlando, Fla., set up a special Internet electronic-mail system for the event. Attendees could access the system with user identifications printed on their badges — in fact, that's all they needed. Yes, the network for this gathering of hundreds of security specialists was accessible without any passwords.

The climb was easy compared with implementation

SAP AG is taking its R/3 software system to new heights. Actually, to the highest point on the planet. Mexican mountain climber Andres Delgado, 27, is using R/3 to plan his ascent of Mount Everest. Delgado left Mexico City for the Himalayas March 15. He hopes to reach the mountain's summit (elevation 8,848 meters) between May 13 and May 25. Delgado is using the R/3 Project System to plan activity dates, training, material and equipment usage, budget, cost control and progress tracking. The trip is being chronicled on Delgado's Web site at vitalsoft.org.mx/mja/everest.97. The big question is, what kind of salary can an SAP consultant with mountain climbing experience demand?

RHI Consulting in Menlo Park, Calif., asked 300 IT professionals about the strangest requests they ever got from a client or end user. Responses included the following:

- *"Can a diskette get a virus if you drop it on the floor?"*
- *"Could you arrange for an antiviral shot for my floppy?"*
- *"Enclosed per your request is a copy of my disk so you can determine the problem." The end user sent a photocopy of the disk.*
- *"I need to install the Mac OS on my IBM PC. Please help ASAP."*
- *"Can I just get the U.S. portion of the World Wide Web?"*
- *"Please help me. I can't seem to fit a third disk in my disk drive."*
- *"How come when I pressed the 'Help' button [F1 key] earlier, you didn't stop by?"*
- *"I accidentally sent an E-mail meant for my wife to my boss. Please help me retrieve it."*

Don't send that news tip to your boss. Send it to news editor Patricia Keefe at patricia_keefe@cw.com or call (508) 820-8183.

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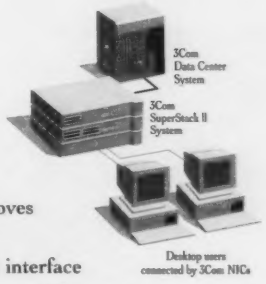

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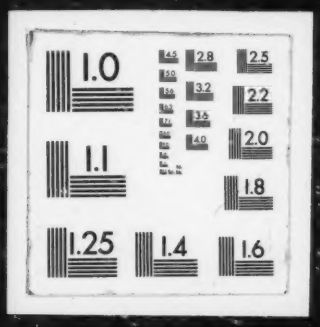
1.0
1.1
1.25
1.4
1.6
2.8
3.2
3.5
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2.5
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1.8